THE EVALUATION OF DISCLOSURE LEVEL OF ENVIRONMENTAL INDICATOR IN SUSTAINABILITY REPORT (CASE STUDY AT PT. TIMAH (PERSERO) Tbk)

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CHAPTER I

INTRODUCTION

1.1 Backgrounds

Nowadays, there has been an increasing awareness and concern about environmental issues amongst environmentalists, governments, and society in general. In such context, companies have been regarded as a major source of pollution and also as biggest user of world material resources. Thats why the strategic companies activities is required to be responsible to managing renewable and unrenewable material resources and to avoid strategic materials shortages. Therefore they have been faced by increasing pressures in order to reduce the impact of their operations on the natural environment.

The other interest issue which need to be concern by companies as an environmental ethics consideration is climate change. The rate and magnitude of global climate changes over the long term have many implications for natural ecosystems. A natural system known as the "greenhouse effect" regulates the temperature on earth. Human activities especially company operation have the potential to disrupt the balance of this system. As human societies adopt increasingly sophisticated and mechanized lifestyles, the amounts of heat-trapping gases in the atmosphere have been increased. By increasing the amount of these gases, humankind has enhanced the warming capability of the natural greenhouse effect. It is the human-induced enhanced greenhouse effect that causes environmental concern. It has the potential to warm the planet at a rate that has never been experienced in human history.

Hence, companies stakeholders have been more and more concernd about both the way in which firms interact with the environment and the extent to which they are engaged in environmental preservation and polution prevention. In order to meet the

growing demands from their stakeholders for reporting evironmental information, firms have tended to voluntary disclose information about environmental issue. However in some cases companies can be reluctant to report on certain aspect of their environmental performance, or the environmental information can be conveyed in a confusing way intended to disguise the "bad news" or the report not refer to the standards requirement.

Therefore, the purpose of evaluating environmental enforcement and compliance is to track and audit the compliance with environmental requirements of the target groups and the result of implementing environmental standards. The assessment will help to get to know the trends of environmental quality and pollution in a given period and area as well as to find out critical issues in implementing environmental requirements. The evaluation can also show the public and other stakeholders the accountability of governments and enterprises in the enforcement and compliance of law, regulation and standards.

Companies required to understand the environmental impacts of their business activities and to disclose the environmental indicator in sustainability report which develop annually. Companies that manage their environmental risks and reduce their consumption of natural resources can save money, which benefits their profitability and public reputation. Then company required to assess and reduce environmental risks and impacts and publicly report and summarise their performance against targets to their customers, shareholders, and wider stakeholders in their statutory Annual Reports and Accounts, with supporting data on their internet web-sites.

Environmental disclosures need to be clear, comparable, and compulsory (as for financial information). This is required because the information not just usefull for internal user but also for external users such as customers, the City, shareholders and potential investors. Without following this requirement they cannot truly assess and

influence behaviour and future prospects of listed companies relative to others. Thats why companies need the to followed the law, regulation and standard.

Sustainability as a whole needs to be measured reported and assured. These areas of expertise fall naturally under an accountant's remit. Good quality information that is trusted and properly targeted is vital to sustainable development. Business need to modify its behavior on the basis of information. Accountancy information can provide feedback on performance which guides management decisions about the future. The successful functioning of this mechanism depends on the availability of accurate and reliable information and on assurance of this non-financial data. Accountants are experienced in providing information and assurance and as business decision-makers. They are also involved in devising company strategy.

Chartered accountants could expect to be involved in a huge range of activities, including: Implementing energy efficiency (and thereby cost-saving) measures, formulating and implementing corporate responsibility policies, designing management information systems – eg around tradable permits and carbon emissions, assurance of supply chain processes and procedures.

General Reporting Initiative (GRI) developed Sustainability Reporting Guidelines is the International Guidelines which consist of principles for defining report context and ensuring the quality of reported environmental information. It also includes environmental disclosures standard which required to be follow by companies especially for big company like PT. Timah (Persero)Tbk.

PT Timah (Persero) Tbk is a company whose main business activities are associated with the tin mining industry. In their Sustainability Report year 2010, authors found that they state "For the year 2010 was, no doubt, the year of quality enhancement. This was evident not only from the management of human resources through more intensive

trainings and improvements to standard operating procedures, but also from the management of natural resources by more careful planning and calculation of reserves, protection and supervision of mines, and reclamations of post-mining areas."

From this statement we can observe this company guarantee that they concern about the environmental and prepare quality environmental disclosure report from quality human resources through more intensive trainings and improvements to standard operating procedures. However, quality report can be measured in disclosure level percentage by evaluate environmental indicators stated in sustainability report weather applied GRI Guidelines Version 3.1.

Based on the background of the above problems, the author are interested in doing research with the title: **"The Evaluation of Disclosure Level of Environmental Indicator in Sustainability Report (Case Study at PT. Timah (Persero) Tbk)**

1.2 Problem Definition

Based on background above, the proposed issue can be formulated as follows:

"What is the disclosure level of environmental indicators in Sustainability Report PT. Timah (Persero) Tbk accordance with GRI guidelines?"

1.3 Research Objective

The research objective is to evaluate the disclosure level of environmental indicator in Sustainability Report PT. Timah (Persero) Tbk accordance with GRI Guidelines Version 3.1 (2000-2011 GRI).

1.4 Research Benefits

The study will achieve the following benefits:

a. For Company : this research is usefull for the company as an input to be considered for company's improvement.
b. For Author : Adding insight, knowledge and understanding by author about the disclosures level of company environmental indicators accordance with GRI guidelines.
c. For Governance : this research will have a benefit for the governance to make the regulation.

1.5 Writing Systematic

The writing systematic of this study is as follows:

1. Chapter I is introduction that will give description about background, problem definition, objectives of the research, benefits of the research and writing systematic.

2. Chapter II Theoretical Framework shows the previous research which useful as additional knowledge for author about this topic. This chapter also provides an overview of literature survey about stakeholder theory, sustainable development, sustainable ethics, environmental risk, Kyoto Equator Principles, and Corporate Social Responsibility. Finally, as a measurement tools of this research, GRI Sustainability Report Guidelines Version 3.1 is presented excessively. Moreover, the standard of environmental indicator disclosures is fully presented at the end of this chapter.

3. Chapter III Research Methodology discusses object of research, type of research, type of data, data gathering method, and data analysis.

4. Chapter IV provides discussion of research. Consist of company profile, business process of Sustainability Report developing. Moreover, author also elaborate process evaluation of the Environmental Indicator disclosures listed in Sustainability Report PT. Timah (Persero) Tbk link with GRI 3.1.

5. Chapter V consists of conclusion, research limitation and suggestion. So, Author will describe the conclusion of all the result of research presented by the previous chapter and add feedback in form of suggestion, and also discuss the limitation of research.

CHAPTER II

THEORETICAL FRAMEWORK

2.1 Review of Previous Research

To support this research, author also uses the information from other researcher. There are several previous researches about disclosures level of environmental indicator. The first review is research conducted by C. Braga, P.P. Silva, G.P. Santos (2011) which is closely related to the subject discuss in this thesis. The title of his thesis is "Level of Disclosure of Environmental Information in the Electricity Sector: an Empirical Study of Brazil and Iberian Peninsula." The important point to be concluded that the environmental disclosure level had implemented accordance with GRI Guidelines. This research focuses on the literature review that includes the report and environmental disclosure, the contents of the publication, GRI indicators, previous studies on the level of disclosure, the methodology and the sample definition. The conclusions show that Brazilian companies are in the process of improving the level of disclosure and the Iberian ones are divided between those that grew in the dissemination and those that experienced a reduction. So, this research is guidance for the author to analyze the implementation of this standard toward environmental performance indicator stated in PT. Timah (Persero) Tbk.

The other research which has reviewed titled "Environmental Enforcement and Compliance Indicators In China". This research was developed by Ge, Chazhong, Yang, Jintian, Tong, Yang, Tong, Kai, and Cao, Dong (2004). This research paper provides brief information on the environmental enforcement and compliance indicators in China. So, by this research information author know the other research perspective about the

importance of enforcement and compliance of laws, regulations and standards, and finally helpfull to add authors recommendation.

In order to increase knowledge about the factors that influencing environmental disclosure author also reviewed the final thesis conducted by M.F.X. Eggen (2010). The paper was titled "The impact of mission content on environmental disclosure: A sicio-political perspective". The objective of this paper is to determine whether the strategic commitment to environmental stakeholders as communicated by the mission statement has an impact on the level of public environmental disclosures within Ullmann's (1985) framework. The methodology is used of a large dataset with 141 observations enables the multivariate analyses of qualitative and quantitative environmental disclosure levels, while testing for stakeholder power, economic performance, and country-, industry-, and firm-specific factors. The results of this research indicate that mission content is generally not related to the level of disclosures regarding environmental matters. Despite Ullmann's (1985) argument that organizations will show a strategic response to stakeholder demands and manage stakeholder relationships accordingly by means of social disclosures, they mainly find evidence to support the claim that financial performance is positively related to environmental disclosure levels. The results however do indicate that the mission statement positively impacts environmental disclosures primarily concerning a company's environmental performance such as water and emission related items. So, this research used by author to evaluate whether some aspects of a company's environmental practices have impacted by the mission content of company.

The other related research is "Pengaruh environmental performance and environmental disclosure terhadap economic performancc". This research is conducted by Eifeliena Nuraini F (2010). By using hypothesis testing between variables get from

annual financial report and sustainability report of 15 company listed in BEI and proper year 2006-2008, the researcher find the result that neither first nor second hypothesis there is no impact of environmental performance toward economic performance. This research is usefull by author because its Theoritical Framework have contain the Stakeholder Theory, Sustainable Development and Corporate Social Responsibility (CSR). So, it used as a guidance by author to know the referrence.

Other previous research used conducted by Hassan, Nasr and Taha (2010) titled "Corporate social responsibility disclosure: an examination of framework of determinants and consequences". At a country level, both cultural values and economic level determine the level of social responsibility disclosure in the country. Concerning determinants of CSD at a company level, it appears that quantity of CSD, and to lesser extent quality of CSD, can be determined according to the following variables: corporate size, type of activity, media pressure, board size, the presence of corporate responsibility committee as a board committee, and ownership diffusion. With regard to the consequences of CSD, the empirical evidence indicates that CSD significantly influences corporate social reputation, while it has impact on corporate market value. So, this research is usefull to support the author understanding in making the recommendation about the importance of Corporate Social Responsibility disclosure toward the value and profit of a company.

2.2 Stakeholder Theory

According to Charles Fontaine, Antoine Haarman and Stefan Schmid (2006) there are the basic ideas of the Stakeholder Theory and definition, as follows:

The traditional definition of a stakeholder is "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman 1984). The general idea of the Stakeholder concept is a redefinition of the organization. In general

the concept is about what the organization should be and how it should be conceptualized. Friedman (2006) states that the organization itself should be thought of as grouping of stakeholders and the purpose of the organization should be to manage their interests, needs and viewpoints. This stakeholder management is thought to be fulfilled by the managers of a firm. The managers should on the one hand manage the corporation for the benefit of its stakeholders in order to ensure their rights and the participation in decision making and on the other hand the management must act as the stockholder's agent to ensure the survival of the firm to safeguard the long term stakes of each group.

The definition of a stakeholder, the purpose and the character of the organization and the role of managers are very unclear and contested in literature and has changed over the years. Even the "father of the stakeholder concept" changed his definition over the time. In one of his latest definitions Freeman (2004) defines stakeholders as "those groups who are vital to the survival and success of the corporation". In one of his latest publications Freeman (2004) adds a new principle, which reflects a new trend in stakeholder theory. In this principle in his opinion the consideration of the perspective of the stakeholders themselves and their activities is also very important to be taken into the management of companies. He states "The principle of stakeholder recourse. Stakeholders may bring an action against the directors for failure to perform the required duty of care" (Freeman 2004).

All the mentioned thoughts and principles of the stakeholder concept are known as normative stakeholder theory in literature. Normative Stakeholder theory contains theories of how managers or stakeholders should act and should view the purpose of organization, based on some ethical principle (Friedman 2006). Another approach to the stakeholder concept is the so called descriptive stakeholder theory. This theory is concerned with how managers and stakeholders actually behave and how they view their

actions and roles. The instrumental stakeholder theory deals with how managers should act if they want to flavor and work for their own interests. In some literature the own interest is conceived as the interests of the organization, which is usually to maximize profit or to maximize shareholder value. This means if managers treat stakeholders in line with the stakeholder concept the organization will be more successful in the long run. Donaldson and Preston (1995) have made this three-way categorization of approaches to the stakeholder concept kind of famous.

In the past view years the concept of stakeholders has boomed a lot and academics wrote a lot about the topic. But also non-governmental organizations (NGOs), regulators, media, business and policymakers are thinking about the concept and are trying to implement it in some way or the other. Most contributions are particularly about the normative principle. They promote the vision of the company and the role of managers whose objective is mainly to maximize shareholder value in order to be sustainable. However, this perspective seems to be giving way to that business has more and broader responsibilities. Those are best defined in terms of the stakeholder approach. Another reason why this topic is very popular and contested among theorists is that there is quit an amount of contesting literature around which is tried to be replaced and up dated.

Along with the popularity has come a profusion of different overlapping approaches to the stakeholder concept. This has led to a confusing situation in this sector. In order to deal with this conceptual con fusion a number of classification schemes have been developed. The most famous literature contribution which makes the distinction between normative and strategic or analytical stakeholder theory was done by Donaldson and Preston in 1995.

2.2.1 Different definitions of Stakeholder

As a consequence of the booming of the stakeholder concept and the literature written about the topic a lot of different definitions of stakeholder developed. The use of the stakeholder approach in big variety of context brings some criticism to the concept with it. Friedman (2006) mentions:

"That group of writers comes to coalesce around particular social constructions of reality, leading to writers referring to stakeholders without being aware of relevant theoretical issues that have been raised in other literatures."

Roberts and Mahoney (2004) have examined 125 accounting studies that used the stakeholder language and found that nearly 65 percent "use the term stakeholder without reference to any version of stakeholder theory". The important thing is that writers use the same label to refer to a lot different concepts. This of course can have great consequences on ethical, policy, and strategic conclusions.

1. What is a Stakeholder?

   In the book of Freeman (1984) the earliest definition is often credited to an internal memo report of the Stanford Research Institute (SRI) in 1963. They define them as "those groups without whose support the organization would cease to exist". Freeman (2004) has continued to use this definition in a modified form: "those groups who are vital to the survival and success of the organization". This definition is entirely organization orientated so the academic circles prefer the definition of Freeman (1984) where he defines stakeholders as "any group or individual who can affect or is affected by the achievement of the organization objectives". About twenty of the 75 definitions share this definition. Friedman (2006) states that this definition is more balanced and much broader than the

definition of the SRI. The phrase "can affect or is affected by" seems to include individuals of outside the firm and groups may consider themselves to be stakeholders of an organization, without the firm considering them to be such. A more detailed distinction and analysis of the different definitions would go far beyond the extent of this paper.

2. Who are Stakeholders?

A very common way of differentiating the different kinds of stakeholders is to consider groups of people who have classifiable relationships with the organization. Friedman (2006) means that there is a clear relationship between definitions of what stakeholders and identification of who are the stakeholders. The main groups of stakeholders are:

a. Customers
b. Employees
c. Local communities
d. Suppliers and distributors
e. Shareholders

In addition other groups and individuals are considered to be stakeholders in the literature of Friedman (2006):

a. The media
b. The public in general
c. Business partners
d. Future generations
e. Past generations (founders of organizations)
f. Academics

g. Competitors

h. NGOs or activists – considered individually, stakeholder representatives

i. Stakeholder representatives such as trade unions or trade associations of suppliers or distributors.

j. Financiers other than stockholders (dept holders, bondholders, creditors)

k. Government, regulators, policymakers

Managers are treated differently in the literature. Some regard them as stakeholders others embody them in the organization's actions and responsibilities. A very interesting view of managers came from Aoki (1984), who saw managers as referees between investors and employees.

Of course all categories of stakeholder groups could be defined more finely. For example media could be split up into radio, television and print media, or employees as blue-collar and white collar workers, or in terms for which department they work. An advantage of finer categories of stakeholders is that by doing so more homogeneous grouping of people is more likely. The negative fact about this would be the greater chance of overlap of interests and actions.

2.2.2 History of the Stakeholder Theory

In the mid-1980 a stakeholder approach to strategy came up. One focal point in this movement was the publication of Richard Edward Freeman. He is generally credited with popularizing the stakeholder concept. The title of the work is – Strategic Management and only the subtitle is A Stakeholder Approach and came out in 1984. Doing this he indicated that his view of the stakeholder concept was done from the perspective of the company. He built on the process work of Ian Mitroff, Richard Mason and James Emshoff. Actually the use of the word stakeholder came from the

pioneering work done at Stanford Research Institute (SRI) in the 1960s. They further were heavily influenced by several concepts that were developed in the planning department of the Lockheed Company and these ideas were developed from the researching done by Igor Ansoff and Robert Steward. Ansoff was around 1960s working for the SRI in association with Lockheed (Friedman 2006). It is also clear that business leaders were thinking and expressing the stakeholder concept long before the early 1960s. Dodd (1932) states that already GEC was identifying four main groups which whom they had to deal with. Those four groups were defined as shareholders, employees, customers, and the general public. Further, Preston and Sapieca (1990) mentioned that Johnson & Johnson identified customers, employees, managers, and the general public in 1947. The company Sears named "four parties to any business in the order of their importance"as "customers, employees, community and stockholders"in the year 1950. Schilling (2000) that the start of thinking about the stakeholder concept was the work of Follet in 1918. Friedman (2006) considers "Here a concern about the corporation, which emerged along with the origins of the corporation as a legal entity which he, calls the soulless corporation".

This shows a moral or normative vacuum that has favored ideas of how this could or should be dealt with. In order so fill this vacuum the stakeholder concept has come up to handle this demand. By distinguishing in this work between pre- and post- Freeman (1984) it should be easier to understand why the stakeholders approach has become so popular during the last twenty years. Generally important to know is that from the start on the stakeholder approach grew out of management practice.

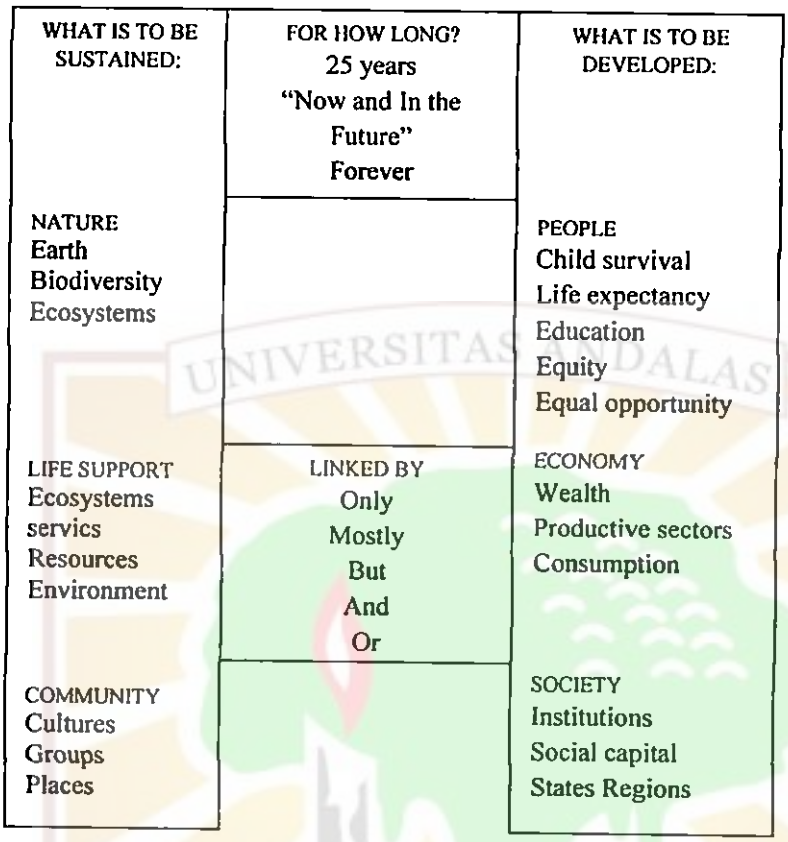
2.3 Sustainable Development

Robert (2006) stated the definitions of sustainable development as follows:

The Brundtland Commission's brief definition of sustainable development as the "ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" is surely the standard definition when judged by its widespread use and frequency of citation. The use of this definition has led many to see sustainable development as having a major focus on intergenerational equity. Although the brief definition does not explicitly mention the environment or development, the subsequent paragraphs, while rarely quoted, are clear. On development, the report states that human needs are basic and essential; that economic growth—but also equity to share resources with the poor—is required to sustain them; and that equity is encouraged by effective citizen participation. On the environment, the text is also clear:

"The concept of sustainable development does imply limits—not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities."

Figure 1.Definitions of sustainable development



SOURCE: U.S. National Research Council, Policy Division, Board on Sustainable Development, "Our Common Journey: A Transition Toward Sustainability (Washington, DC: National Academy Press, 1999).

Peter Hardi and Terrence Zdan (1997) was directed the Principles in Practice of Assessing Sustainable Development, as the result of the Bellagio project. This project was undertaken by IISD (The International Institute for Sustainable Development) staff and a group of experts and collaborators.

These principles serve as guidelines for the whole of the assessment process including the choice and design of indicators, their interpretation and communication of the result. They are interrelated and should be applied as a complete set. They are intended for use in starting and improving assessment activities of community groups, non-government organizations, corporations, national governments, and international institutions.

These principles deal with four aspects of assessing progress toward sustainable development. Principle 1 deals with the starting point of any assessment - establishing a vision of sustainable development and clear goals that provide a practical definition of that vision in terms that are meaningful for the decision-making unit in question. Principles 2 through 5 deal with the content of any assessment and the need to merge a sense of the overall system with a practical focus on current priority issues. Principles 6 through 8 deal with key issues of the process of assessment, while Principles 9 and 10 deal with the necessity for establishing a continuing capacity for assessment.

2.4 Sustainable Ethics

According to Arch 125 (2006), Sustainable building is not a new style of building. It is a way to think about how we design, construct, and operate buildings. Its primary goal is to lessen the harm poorly designed buildings cause by using the best of ancient building approaches in logical combination with the best of new technological advances. Its ultimate goal is to make possible offices, homes, even entire subdivisions that are net *producers* of energy, food, clean water and air, beauty, and healthy human and biological communities. Green buildings try to take less from the earth and give more to people.

2.4.1 Sustainable checklist

Ideally a sustainable building should:

1. Make appropriate use of land
2. Use water, energy, lumber, and other resources efficiently
3. Enhance human health
4. Strengthen local economies and communities
5. Conserve plants, animals, endangered species, and natural habitats

6. Protect agricultural, cultural, and archaeological resources
7. Be nice to live in
8. Be economical to build and operatelly a sustainable building should:
9. Make appropriate use of land

Climate change is a change in the "average weather" that a given region experiences. Average weather includes all the features we associate with the weather such as temperature, wind patterns and precipitation. When we speak of climate change on a global scale, we are referring to changes in the climate of the Earth as a whole. The rate and magnitude of global climate changes over the long term have many implications for natural ecosystems.

A natural system known as the "greenhouse effect" regulates the temperature on earth. Human activities have the potential to disrupt the balance of this system. As human societies adopt increasingly sophisticated and mechanized lifestyles, the amounts of heat-trapping gases in the atmosphere have been increased. By increasing the amount of these gases, humankind has enhanced the warming capability of the natural greenhouse effect. It is the human-induced enhanced greenhouse effect that causes environmental concern. It has the potential to warm the planet at a rate that has never been experienced in human history.

2.4.2 The Role of Energy Efficiency

Worldwide energy assessments now indicate that improving the energy efficiency of buildings, appliances, office equipment, factories, and vehicles could free-up more than a trillion dollars per decade. In addition, these improvements would prevent the release of a rash of environmental pollutants. Environmental

problems like acid rain, urban smog, and global climatechange are directly linked to the combustion of fossil fuels. Greaterreliance on energy efficiency offers countries worldwide a means of maintaining economic growth and environmental quality. For example, the U.S. Climate Change Action Plan will both reduce greenhousegases by 108 million tons and save Americans $260 billion.

2.4.3 Renewables

Ideally a green building should not just get its daylight and heat, but also its electricity from the sun or other renewable energy sources.

Renewable energy sources include:

1. solar power
2. wind power
3 hydro
4 biomass
5 geothermal power

2.4.4 Sustainability and Architecture

Environmentally responsible architecture can make a huge difference.

1. Design and Construction Industry as potential single largest contributor (40%)
2. Canada's solutions for compliance with the Kyoto Protocol and for creating long term ecological sustainability.
3. Environmental Design is definitely an avenue towards sustainability.
4. Great potential for 'Environmental Leadership' in architecture

Five principles of an environmental, are:

1. Healthful Interior Environment.
2. Energy Efficiency.
3. Ecologically Benign Materials.
4. Environmental Form.
5. Good Design.

2.5 Environmental Risk

Zachary Stern (2007) stated the definition of environmental risk as follows: According to Merriam-Webster's Dictionary, 'risk' is defined as "the possibility of loss of injury" or "someone or something that creates or suggests a hazard." Explicit in the is risk's association with chance and probability. Implicit in the definition is the ability to quantify that probability. While that process of quantification may be impulsive and cursory for the layman assessing everyday risks, science has made...well, a science of empirically quantifying risk. Within the realm of environmental risk, this process involves a multi-staged analysis characterized by a "risk assessment", "risk characterization" and "risk management".

According to the EPA a risk assessment is "the evaluation of scientific information on the hazardous properties of environmental agents, the dose-response relationship, and the extent of human exposure to those agents" (EPA Glossary of IRIS Terms). In essence a pollutant is identified and its possible effects on those exposed is described (Cobourn, 2005). The result of this analysis "is a statement regarding the probability that populations or individuals so exposed will be harmed and to what degree," (EPA Glossary of IRIS Terms) also known as a risk characterization. Once risk has been assessed and characterized, "political, social, economic and engineering implications

together with risk-related information" are gathered "in order to develop, analyze and compare management options and select the appropriate managerial response to a potential chronic health hazard" (EPA Glossary of IRIS Terms). This process is called risk management. Together these steps comprise the scientific approach to risk.

The implications of this situation are twofold:

1. First, those being affected by environmental hazards are deprived of agency in dealing with their problems and are left to wonder how their voice is being incorporated into a supposed democratic dialogue.
2. Secondly, science – a method in and of itself that gives credence to the observed and the experiential – fails to take advantage of the large repository of local knowledge that exists within every community. This failure leads to a growth in the diaspora between the professional and the layman, which, in turn, works to undermine our faith in the benefits attributed to society through science.

Graphic Training Aid (GTA) (1995) illustrates how the risk assessment process is used to assess and reduce environmental-related risk while conducting operations. Although all risk cannot be eliminated, leaders must identify hazards that may negatively impact the environment and implement controls to reduce the overall risk. Remember, assessing environmental-related risk is only a part of the overall risk-management process.

Risk decisions are commanders' business. Such decisions are normally based on the next higher commander's guidance on how much risk he is willing to accept and delegate for the mission. Risk decisions should be made at the lowest possible level, except in extreme circumstances.

Both leaders and staff manage risk. Staff members continuously look for hazards associated with their areas of expertise. They then recommend controls to reduce risks.

Hazards and the resulting risks may vary as circumstances change and experience is gained. Leaders and individual soldiers become the assessors for everchanging hazards such as those associated with the environment (weather; visibility; contaminated air, water, and soil), equipment readiness, individual and unit experience, and fatigue. Leaders should advise the chain of command on risks and risk-reduction measures.

Risk management is the process of identifying, assessing, and controlling risk that arises from operational factors and balancing risk with mission benefits. This description integrates risk management into the military decision-making process (MDMP). Field Manual (FM) 100-14 outlines the risk-management process and provides the framework for making risk management a routine part of planning, preparing, and executing operational missions and everyday tasks. Assessing environmental-related risks is part of the total risk-management process. The five steps in the risk management process are as follows:

1. Identify environmental hazards.
2. Assess environmental hazards to determine the risk.
3. Develop controls and make risk decisions.
4. Implement the controls.
5. Supervise and evaluate.

2. 6 Kyoto Protocol

According to Arch 125 (2006), The Kyoto protocol was agreed upon through international co-operation under the United Nations Framework Convention on Climate Change (UNFCCC), which was created in 1992. The Kyoto protocol came out of the UNFCCC's December 1997 meeting held in Kyoto, Japan. Under the agreement,

industrialized nations must reduce their emissions of greenhouse gases by an average of 5.2 per cent (from 1990 levels) by the period 2008 to 2012.

According to Kyoto Protocol (2005), in 1998 United Nations was presented the content of Convention on climate change agreement with the title Kyoto Protocol To The United Nations Framework Convention On Climate Change. Based on Article 2, the implement and/or further elaborate policies and measures in accordance with its national circumstances (parties included in Annex I), are as follows:

1. Enhancement of energy efficiency in relevant sectors of the national economy;
2. Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;
3. Promotion of sustainable forms of agriculture in light of climate change considerations;
4. Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;
5. Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;
6. Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;
7. Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;

8. Limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy;

There are six greenhouse gases covered under the protocol to the international convention on climate change (the Kyoto Protocol) – carbon dioxide (CO2), methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).

The Sectors/source categories containing in Kyoto Protocol are:

1. Energy
   a. Fuel combustion (Energy industries, Manufacturing industries and construction, Transport, Other sectors, and Other)
   b. Fugitive emissions from fuels (Solid fuels, Oil and natural gas, and Other)
2. Industrial processes (Mineral products, Chemical industry, Metal production, Other production, Production of halocarbons and sulphur hexafluoride, Consumption of halocarbons and sulphur hexafluoride, and Other)
3. Solvent and other product use
4. Agriculture (Enteric fermentation, Manure management, Rice cultivation, Agricultural soils, Prescribed burning of savannas, Field burning of agricultural residues, and Other)
5. Waste (Solid waste disposal on land, Wastewater handling, Waste incineration, and Other)

2.7 Corporate Social Responsibility

According to Paul Hohnen (2007), the definition of corporate social responsibility state by Working definition, ISO 26000 Working Group on Social Responsibility, Sydney, February 2007 is as follows:

"Social responsibility (is the) responsibility of an organisation for the impacts of its decisions and activities on society and the environment through transparent and ethical behaviour that is consistent with sustainable development and the welfare of society; takes into account the expectations of stakeholders; is in compliance with applicable law and consistent with international norms of behaviour; and is integrated throughout the organisation."

Corporate social responsibility (CSR) is also known by a number of other names. These include corporate responsibility, corporate accountability, corporate ethics, corporate citizenship or stewardship, responsible entrepreneurship, and "triple bottom line," to name just a few. As CSR issues become increasingly integrated into modern business practices, there is a trend towards referring to it as "responsible competitiveness" or "corporate sustainability."

A key point to note is that CSR is an evolving concept that currently does not have a universally accepted definition. Generally, CSR is understood to be the way firms integrate social, environmental and economic concerns into their values, culture, decision making, strategy and operations in a transparent and accountable manner and thereby establish better practices within the firm, create wealth and improve society. As issues of sustainable development become more important, the question of how the business sector addresses them is also becoming an element of CSR.

The World Business Council for Sustainable Development has described CSR as the business contribution to sustainable economic development. Building on a base

of compliance with legislation and regulations, CSR typically includes "beyond law" commitments and activities pertaining to:

1. corporate governance and ethics.
2. health and safety
3. environmental stewardship
4. human rights (including core labour rights)
5. sustainable development
6. conditions of work (including safety and health, hours of work, wages)
7. industrial relations
8. community involvement, development and investment
9. involvement of and respect for diverse cultures and disadvantaged peoples
10. corporate philanthropy and employee volunteering
11. customer satisfaction and adherence to principles of fair competition
12. anti-bribery and anti-corruption measures
13. accountability, transparency and performance reporting; and
14. supplier relations, for both domestic and international supply chains.

Finally, it is also important to acknowledge that while positive or neutral correlations between social and environmental responsibility and superior financial performance have generally been supported by the evidence, conclusive causal links have not. Many studies are being undertaken, with varying conclusions. Overall, one of the keys to ensuring that the effects of adopting CSR are positive for business is through appropriate planning and monitoring.

According to Law of the Republic of Indonesia Number 40 (2007), the meaning of Environmental and Social Responsibility is:

"A Company's commitment to taking part in sustainable economic development in order to improve the quality of life and environment, which will be beneficial for the Company itself, the local community and society in general." (Chapter I, Article 1, point 3)

Article 66 also have the regulation that Environmental and Social Responsibility must be contained by companies in their annual report.

Below is the regulation of Environmental and Social Responsibility (Chapter V, Article 74):

1. Companies doing business in the field of and/or in relation to natural resources must put into practice Environmental and Social Responsibility.
2. The Environmental and Social Responsibility contemplated in paragraph (1) constitutes an obligation of the Company which shall be budgeted for and calculated as a cost of the Company performance of which shall be with due attention to decency and fairness.
3. Companies who do not put their obligation into practice as contemplated in paragraph (1) shall be liable to sanctions in accordance with the provisions of legislative regulations.
4. Further provisions regarding Environmental and Social Responsibility shall be stipulated by Government Regulation.

2.8 The Role of Accountant on Sustainability Report

According to The Institute of Chartered Accountants in England & Wales (ICAEW) (2004) the professionally qualified accountants in businesses with significant environmental or social impacts are often involved with the measurement, recording and interpretation of sustainability issues. The large accounting firms are also active in many

aspects of sustainability. Smaller firms tend to see such matters as an irrelevance and, as yet, have not experienced any significant demand for services in this area. However, such demand is expected to increase, particularly as regards taxes and instruments such as tradable permits and allowances.

As history shows, the frontiers of accountancy have continually expanded to meet new demands, often in response to business needs caused by new laws and regulations. Professionally qualified accountants are used to exercising judgement to tackle new problems and apply new expertise in a context of fundamental principles and professional ethics. With the increasing importance attached to environmental protection and social responsibility, many of the issues raised by the quest for sustainable development are business risk issues, an area commonly of concern to accountants.

The accountancy profession plays an important part in the development of national and European law as well as guidance, standards and frameworks for information reporting and assurance. This role has often extended to non-financial information, for example on corporate governance.

Despite some unfamiliar terminology associated with sustainability issues, there is much that is closely related to the skills and experience of accountants: for example, the identification and management of risks, corporate governance, compliance with laws and regulations, design and operation of management control systems, measurement of liabilities and impaired assets, information reporting and assurance, financial instruments and new forms of taxation. Where the technical issues extend beyond an accountant's reach, working with other experts is already recognised as good practice.

European and global initiatives, such as the progressive improvements agreed at Kyoto, have contributed to a greater willingness to introduce prohibitions, regulations and taxes that are designed to move towards sustainable development. A number of different

mechanisms are being adopted to build a sustainability infrastructure that works with the grain of markets. Underpinning all of these mechanisms is the need for internal and external reporting and assurance.

Accountants have a role in developing, understanding and operating all the mechanisms identified as elements of the sustainability infrastructure. In the case of regulations, taxation and tradable permits, accountants will continue to be involved in providing public policy advice and assisting with practical implementation. There are also questions to be considered such as whether the mechanisms work and are effective in achieving the desired results and whether different approaches would be more efficient.

New requirements, such as the statutory OFR, will bring accountants face-to-face with the need to address environmental and social issues and the processes adopted by directors in deciding whether they are of sufficient relevance to warrant disclosure. With an overall understanding of the business environment and relevant regulations, taxation and markets, accountants will be expected to act as a first port of call for advice. Obtaining and providing information about the various measures, together with the related interpretation, will be important elements of an accountant's role, both in business and in practice.

Sustainability issues present a new market focus for the profession. Internalisation of external costs through such devices as tradable allowances and the other mechanisms described in the report clearly requires accounting expertise. In future, management information systems and controls will need to include environmental and social data, emphasising the need for a joined-up approach. Accountants are well placed to identify and meet needs for co-ordination and integration.

If sustainability issues were to be neglected by current and future members of the accountancy profession, there is a risk that accountants' involvement in areas such as

management systems, strategic planning, statutory requirements and tax, internal and external reporting, as well as assurance, will be diminished. This would be a loss to society as well as to the accountancy profession.

Given that sustainability is a growth area and that several other professions are active in the field, there is an opportunity for the accountancy profession to:

1. ensure that the necessary training and advice is available to those who need it;
2. continue to participate in the development of new guidelines and requirements on sustainability, particularly in the area of reporting and assurance; and
3. put forward proactive ideas to assist business to achieve better sustainability management in support of effective business activity and sound corporate governance.

All of these roles are important and whilst the accountant's main input is providing useful information and assisting in its interpretation, this contribution must also have regard to the larger picture and the need to consider the maintenance and long-term enhancement of all types of capital and to balance the dynamism of markets with wider social demands to do the right thing.

This report has supported the words of John Elkington that 'the sustainability agenda is bigger and more complex than individual reports of its parts might suggest, increasingly demanding joined-up thinking from companies and their boards'. Accountants are well equipped to provide, support and promote that joined-up thinking.

All the mechanisms we have identified require credible information flows to operate effectively and to gain public confidence. Internally, management systems will face demands for new information to support decisions that have previously not had to be addressed. Environmental taxes, new categories of assets, such as tradable permits and the related liabilities, including contingent liabilities, will need to be accounted for and reported externally.

Compliance with voluntary codes of conduct, corporate policies and supply chain standards may need to be confirmed on an enterprise-wide basis. Information required for effective stakeholder engagement, benchmarking and rating purposes will have to be gathered. Companies that are subject to new requirements for the OFR will collect much of this information as part of the regular process of reporting.

It is our belief that the accountancy profession will be well placed to take leading roles in addressing new reporting issues and related assurance processes. The practical approach commonly adopted by professional accountants will be fundamental to ensuring that the mechanisms operate properly

2.9 Sustainability Reporting- GRI 3.1

2.9.1 The Purpose of a Sustainability Report

Sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development. 'Sustainability reporting' is a broad term considered synonymous with others used to describe reporting on economic, environmental, and social impacts (e.g., triple bottom line, corporate responsibility reporting, etc.). A sustainability report should provide a balanced and reasonable representation of the sustainability performance of a reporting organization – includingboth positive and negative contributions.

Sustainability reports based on the GRI Reporting Framework disclose outcomes and results that occurred within the reporting period in the context of the organization's commitments, strategy, and management approach. Reports can be used for the following purposes, among others:

1. Benchmarking and assessing sustainability performance with respect to laws, norms, codes, performance standards, and voluntary initiatives;
2. Demonstrating how the organization influences and is influenced by expectations about sustainable development; and
3. Comparing performance within an organization and between different organizations over time.

2.9.2 Orientation to the GRI Reporting Framework

All GRI Reporting Framework documents are developed using a process that seeks consensus through dialogue between stakeholders from business, the investor community, labor, civil society, accounting, academia, and others. All Reporting Framework documents are subject to testing and continuous improvement.

The GRI Reporting Framework is intended to serve as a generally accepted framework for reporting on an organization's economic, environmental, and social performance. It is designed for use by organizations of any size, sector, or location. It takes into account the practical considerations faced by a diverse range of organizations – from small enterprises to those with extensive and geographically dispersed operations.The GRI Reporting Framework contains general and sector-specific content that has been agreed by a wide range of stakeholders around the world to be generally applicable for reporting an organization's sustainability performance.

The Sustainability Reporting Guidelines (the Guidelines) consist of Principles for defining report content and ensuring the quality of reported information. It also includes Standard Disclosures made up of Performance Indicators and other disclosure items, as well as guidance on specific technical topics in reporting.

Indicator Protocols exist for each of the Performance Indicators contained in the Guidelines. These Protocols provide definitions, compilation guidance, and other information to assist report preparers and to ensure consistency in the interpretation of the Performance Indicators. Users of the Guidelines should also use the Indicator Protocols.

Sector Supplements complement the Guidelines with interpretations and guidance on how to apply the Guidelines in a given sector, and include sector-specific Performance Indicators. Applicable Sector Supplements should be used in addition to the Guidelines rather than in place of the Guidelines.

Technical Protocols are created to provide guidance on issues in reporting, such as setting the report boundary. They are designed to be used in conjunction with the Guidelines and Sector Supplements and cover issues that face most organizations during the reporting process.

2.9.3 Applying the Guidelines

1. Getting Started

All organizations (private, public, or non-profit) are encouraged to report against the Guidelines whether they are beginners or experienced reporters, and regardless of their size, sector, or location. Reporting can take various forms, including web or print, stand alone or combined with annual or financial reports.

The first step is to determine report content. Guidance for this is provided in Part 1. Some organizations may choose to introduce reporting against the full GRI Reporting Framework from the outset, while others may want to start with the most feasible and practical topics first and phase in reporting on other topics over time. All reporting

organizations should describe the scope of their reporting and are encouraged to indicate their plans for expanding their reporting over time.

2. GRI Application Levels

Upon finalization of their report, preparers should declare the level to which they have applied the GRI Reporting Framework via the "GRI Application Levels" system. This system aims to provide:

a. **Report readers** with clarity about the extent to which the GRI Guidelines and other Reporting Framework elements have been applied in the preparation of a report.

b. **Report preparers** with a vision or path for incrementally expanding application of the GRI Reporting Framework over time.

Declaring an Application Level clearly communicates which elements of the GRI Reporting Framework have been applied in the preparation of a report.

a. Incentives for beginners: The Levels provide a starting point for first-time report makers, and also reinforce the importance and value of an incremental approach to reporting which expands over time.

b. Recognizing advanced reporters: A growing number have developed sophisticated reporting systems based on the GRI Framework, that include assurance, and are looking to communicate this to readers in a quick and easy-to-understand way.

They are titled C, B, and A, The reporting criteria found in each level reflects an increasing application or coverage of the GRI Reporting Framework. An organization can self-declare a "plus" (+) at each level (ex., C+, B+, A+) if they have utilized external assurance.

Note: APPENDIX 1 at the end of this thesis paper will shown the Declaring of Application Level which include

An organization self-declares a reporting level based on its own assessment of its report content against the criteria in the GRI Application Levels. In addition to the self declaration, reporting organizations can choose one or both of the following options:

a. Have an assurance provider offer an opinion on the self-declaration.
b. Request that the GRI check the self-declaration.

Reports intended to qualify for level C, C+, B, B+ ,A ,A+ Must contain each of the criteria that are presented in The column for the relevant level.

Note: APPENDIX 2 at the end of this thesis paper, will shown the Application Level Criteria.

3. Request for notification of use

Organizations that have used the Guidelines and/or other elements of the GRI Reporting Framework as the basis for their report are requested to notify the Global Reporting Initiative upon its release. While notifying GRI, organizations can choose any or all of the following options:

a. Simply notify the GRI of the report and provide hard and/or soft copy
b. Register their report in GRI's online database of reports
c. Request GRI check their self-declared Application Level.

4. Maximizing Report Value

Sustainability reporting is a living process and tool, and does not begin or end with a printed or online publication. Reporting should fit into a broader process for setting organizational strategy, implementing action plans, and assessing outcomes. Reporting

enables a robust assessment of the organization's performance, and can support continuous improvement in performance over time. It also serves as a tool for engaging with stakeholders and securing useful input to organizational processes.

2.9.4 Standard of Disclosure Level

The Global Reporting Initiative (GRI) provides the guidelines of standard of disclosure level (GRI indicator 2010). This guidelines is developed as standard for the company to measures the level of their performance disclosure. On the other hand, before the company makes the self-declared of their sustainability reporting, they should provide an index to their disclosures against the GRI indicators, started by the standard of disclosure level (wether the indicator is fully, partially, or not applied againts GRI). Below is the standard of the disclosure level that author got from 2010 Disclosure Level of BG Group, as the main guidelines that author used in this research.

Table 1: The standard of disclosure level

INDICATOR STANDARD	DISCLOSURE LEVEL
Indicator is covered in full	Fully
Indicator is covered in part: Timeframe given for reporting in full: short term (one year); medium term (two to four years); and long term (five years or over)	Partial
Indicator does not apply to the company business	Not applied

2.9.5 Orientation to the GRI Guidelines

A. *Reporting Principles*

Reporting Principles required to be considered by a company in order to describe the outcomes a report should achieve and guide decisions throughout the reporting process, such as selecting which topics and Indicators to report on and how to report on them. Reporting Principles for defining the report content consist of materiality, stakeholder inclusiveness, sustainability context, and completeness, along with a brief set of tests for each Principle. Application of these Principles with the Standard Disclosures determines the topics and Indicators to be reported. This is followed by Principles of balance, comparability, accuracy, timeliness, reliability, and clarity, along with tests that can be used to help achieve the appropriate quality of the reported information.

Each of the Principles consists of a definition, an explanation, and a set of tests for the reporting organization to assess its use of the Principles. The tests are intended to serve as tools for self-diagnosis, but not as specific disclosures to report against. Tests can, however, serve as a reference for explaining decisions about the application of the Principles.

Together, the Principles are intended to help achieve transparency – a value and a goal that underlies all aspects of sustainability reporting. Transparency can be defined as the complete disclosure of information on the topics and Indicators required to reflect impacts and enable stakeholders to make decisions, and the processes, procedures, and assumptions used to prepare those disclosures. The Principles themselves are organized into two groups:

a. Principles for determining the topics and Indicators on which the organization should report; and
b. Principles for ensuring the quality and appropriate presentation of reported information.

The Principles have been grouped in this way to help clarify their role and function, but this does not impose a rigid restriction on their use. Each Principle can support a range of decisions, and may prove useful in considering questions beyond just defining report content or ensuring the quality of reported information.

1. Content Principles

In order to ensure a balanced and reasonable presentation of the organization's performance, adetermination must be made about what content the report should cover. This determination should be made by considering both the organization's purpose and experience, and the reasonable expectations and interests of the organization's stakeholders. Both are important reference points when deciding what to include in the report.

Each of the Reporting Principles consists of a definition, an explanation, and a set of tests to guide the use of the Principles. The tests are intended to serve as tools for self-diagnosis, but not as specific Disclosure items to report against. The Principles should be used together with the guidance on defining content.

1) Materiality

a. Definition

Materiality is the information in a report should cover topics and Indicators that:

a) reflect the organization's significant economic, environmental, and social impacts, or that

b) would substantively influence the assessments and decisions of stakeholders.

b. Tests

a) In defining material topics, take into account the following: Reasonably estimable sustainability impacts, risks, or opportunities (e.g., global warming, HIV-AIDS, poverty) identified through sound investigation by people with recognized expertise, or by expert bodies with recognized credentials in the field.

b) Significance to Stakeholders, including:

1. Main sustainability interests/topics and Indicators raised by stakeholders (e.g., vulnerable groups within local communities, civil society).
2. The main topics and future challenges for the sector reported by peers and competitors.
3. Relevant laws, regulations, international agreements, or voluntary agreements with strategic significance to the organization and its stakeholders.

c) Significance to the Organization, including:

1. Key organizational values, policies, strategies, operational management systems, goals, and targets.

2. The interests/expectations of stakeholders specifically invested in the success of the organization (e.g., employees, shareholders, and suppliers)
3. Significant risks to the organization.
4. Critical factors for enabling organizational success.
5. The core competencies of the organization and the manner in which they can or could contribute to sustainable development.

d) Prioritizing : The report prioritizes material topics and Indicators.

2) Stakeholder Inclusiveness

a. Definition

The reporting organization should identify its stakeholders and explain in the report how it has responded to their reasonable expectations and interests.

b. Tests

a) The organization can describe the stakeholders to whom it considers itself accountable.

b) The report content draws upon the outcomes of stakeholder engagement processes used by the organization in its ongoing activities, and as required by the legal and institutional framework in which it operates.

c) The report content draws upon the outcomes of any stakeholder engagement processes undertaken specifically for the report.

d) The stakeholder engagement processes that inform decisions about the reportare consistent with the scope and boundary of the report.

3) Sustainability Context

a. Definition

The report should present the organization's performance in the wider context of sustainability.

b. Tests

a) The organization presents its understanding of sustainable development and draws on objective and available information as well as measures of sustainable development for the topics covered in the report.

b) The organization presents its performance with reference to broader sustainable development conditions and goals, as reflected in recognized sectoral, local, regional, and/or global publications.

c) The organization presents its performance in a manner that attempts to communicate the magnitude of its impact and contribution in appropriate geographical contexts.

d) The report describes how sustainability topics relate to long-term organizational strategy, risks, and opportunities, including supply-chain topics.

4) Completeness

a. Definition

Coverage of the material topics and Indicators and definition of the report boundary should be sufficient to reflect significant economic, environmental, and social impacts and enable stakeholders to assess the reporting organization's performance in the reporting period.

b. Tests

a) The report was developed taking into account theentire chain of entities upstream and downstream,and covers and prioritizes all information that should reasonably be considered material on the basis of the principles of materiality, sustainability context, and stakeholder inclusiveness.

b) The report includes all entities that meet the criteria of being subject to control or significant influence of the reporting organization unless otherwise declared.

c) The information in the report includes all significant actions or events in the reporting period, and reasonable estimates of significant future impacts of past events when those impacts are reasonably foreseeable and may become unavoidable or irreversible.

d) The report does not omit relevant information that would influence or inform stakeholder assessments or decisions, or that would reflect significant economic, environmental, and social impacts.

2. Quality principles

This section contains Principles that guide choices on ensuring the quality of reported information, including its proper presentation. Decisions related to the process of preparing information in a report should be consistent with these Principles. All of these Principles are fundamental for effective transparency. The quality of information enables stakeholders to make sound and reasonable assessments of performance, and take appropriate action.

Reporting Principles for defining quality are as follows:

1) Balance

a. Definition

The report should reflect positive and negative aspects of the organization's performance to enable a reasoned assessment of overall performance.

b. Tests

a) The report discloses both favorable and unfavorable results and topics.

b) The information in the report is presented in a format that allows users to see positive and negative trends in performance on a year-to-year basis.

c) The emphasis on the various topics in the report is proportionate to their relative materiality.

2) Comparability

a. Definition

Issues and information should be selected, compiled, and reported consistently. Reported information should be presented in a manner that enables stakeholders to analyze changes in the organization's performance over time, and could support analysis relative to other organizations.

b. Tests

a) The report and the information contained within it can be compared on a year-to-year basis.

b) The organization's performance can be compared with appropriate benchmarks.

c) Any significant variation between reporting periods in the boundary, scope, length of reporting period, or information covered in the report can be identified and explained.

d) Where they are available, the report utilizes generally accepted protocols for compiling, measuring, and presenting information, including the GRI Technical Protocols for Indicators contained in the Guidelines.

e) The report uses GRI Sector Supplements, where available.

3) Accuracy

a. Definition

The reported information should be sufficiently accurate and detailed for stakeholders to assess the reporting organization's performance.

b. Tests

a) The report indicates the data that has been measured.

b) The data measurement techniques and bases for calculations are adequately described, and can be replicated with similar results.

c) The margin of error for quantitative data is not sufficient to substantially influence the ability of stakeholders to reach appropriate and informed conclusions on performance.

d) The report indicates which data has been estimated and the underlying assumptions and techniques used to produce the estimates, or where that information can be found.

e) The qualitative statements in the report are valid on the basis of other reported information and other available evidence.

4) Timeliness

a. Definition

Reporting occurs on a regular schedule and information is available in time for stakeholders to make informed decisions.

b. Tests

a) Information in the report has been disclosed while it is recent relative to the reporting period.

b) The collection and publication of key performance information is aligned with the sustainability reporting schedule.

c) The information in the report (including webbased reports) clearly indicates the time period to which it relates, when it will be updated, and when the last updates were made.

5) Clarity

a. Definition

Information should be made available in a manner that is understandable and accessible to stakeholders using the report.

b. Tests

a) The report contains the level of information required by stakeholders, but avoids excessive and unnecessary detail.

b) Stakeholders can find the specific information they want without unreasonable effort through tables of contents, maps, links, or other aids.

c) The report avoids technical terms, acronyms, jargon, or other content likely to be unfamiliar tostakeholders, and should include explanations (where necessary) in the relevant section or in a glossary.

d) The data and information in the report is availableto stakeholders, including those with particular accessibility needs (e.g., differing abilities, language, or technology).

6) Reliability

a. Definition

Information and processes used in the preparation of a report should be gathered, recorded, compiled, analyzed, and disclosed in a way that could be subject to examination and that establishes the quality and materiality of the information.

b. Tests

a) The scope and extent of external assurance is identified.

b) The original source of the information in the report can be identified by the organization.

c) Reliable evidence to support assumptions or complex calculations can be identified by the organization.

d) Representation is available from the original data or information owners, attesting to its accuracy within acceptable margins of error.

B. Reporting Guidance

Reporting Guidance describes actions that can be taken, or options that the reporting organization can consider when making decisions on what to report on, and generally helps interpret or govern the use of the GRI Reporting Framework. Guidance is provided for defining report content and setting report Boundary.

1. Reporting Guidance for Defining Content

The following approach governs the use of the GRI Reporting Framework in preparing sustainability reports.

1) Identify the topics and related Indicators that are relevant, and therefore might be appropriate to report, by undergoing an iterative process using the Principles of materiality, stakeholder inclusiveness, sustainability context, and guidance on setting the Report Boundary.
2) When identifying topics, consider the relevance of all Indicator Aspects identified in the GRI Guidelines and applicable Sector Supplements. Also consider other topics, if any, that are relevant to report.
3) From the set of relevant topics and Indicators identified, use the tests listed for each Principle to assess which topics and Indicators are material, and therefore should be reported.
4) Use the Principles to prioritize selected topics and decide which emphasized.
5) The specific methods or processes used for assessing materiality should:
   a. Differ for, and can be defined by, each organization;

b. Always take into account the guidance and tests found in the GRI Reporting Principles; and

c. Be disclosed.

In applying this approach:

1) Differentiate between Core and Additional Indicators. All Indicators have been developed through GRI's multi-stakeholder processes, and those designated as Core are generally applicable Indicators and are assumed to be material for most organizations. An organization should report on these unless they are deemed not material on the basis of the Reporting Principles. Additional Indicators may also be determined to be material.
2) The Indicators in final versions of Sector Supplements are considered to be Core Indicators, and should be applied using the same approach as the Core Indicators found in the Guidelines.
3) All other information (e.g., company specific Indicators) included in the report should be subject to the same Reporting Principles and have the same technical rigor as GRI Standard Disclosures.
4) Confirm that the information to be reported and the Report Boundary are appropriate by applying the Principle of completeness.

2. Reporting Guidance for Boundary Setting

In parallel with defining the content of a report, an organization must determine which entities' (e.g., subsidiaries and joint ventures) performance will be represented by the report. The Sustainability Report Boundary should include the entities over which the reporting organization exercises control or significant influence both in and through its relationships with various entities

upstream (e.g., supply chain) and downstream (e.g., distribution and customers).

For the purpose of setting boundaries, the following definitions should apply:

a. Control: the power to govern the financial andoperating policies of an enterprise so as to obtain benefits from its activities.
b. Significant influence: the power to participate in the financial and operating policy decisions of the entity but not the power to control those policies.

The guidance below on setting the Report Boundary pertains to the report as a whole as well as setting the boundary for individual Performance Indicators.

Not all entities within the Report Boundary must be reported on in the same manner. The approach to reporting on an entity will depend on a combination of the reporting organization's control or influence over the entity, and whether the disclosure relates to operational performance, management performance, or narrative/descriptive information.

The Report Boundary guidance is based on the recognition that different relationships involve differing degrees of access to information and the ability to affect outcomes. For example, operational information such as emissions data can be reliably compiled from entities under the control of an organization, but may not be available for a joint venture or a supplier. The Report Boundary guidance below sets minimum expectations for the inclusion of entities upstream and downstream when reporting on Indicators and management disclosures. However, an organization may determine that it is

necessary to extend the boundary for an Indicator(s) to include entities upstream or downstream. Determining the significance of an entity when collecting information or considering the extension of a boundary depends on the scale of its sustainability impacts. Entities with significant impacts typically generate the greatest risk or opportunity for an organization and its stakeholders, and therefore are the entities for which the organization is most likely to be perceived as being accountable or responsible.

Reporting guidance for boundary setting are as follow:

1) A sustainability report should include in its boundary all entities that generate significant sustainability impacts (actual and potential) and/ or all entities over which the reporting organization exercises control or significant influence with regard to financial and operating policies and practices.
2) These entities can be included using either Indicators of operational performance, Indicators of management performance, or narrative descriptions.
3) At a minimum, the reporting organization should include the following entities in its report using these approaches:
    a. Entities over which the organization exercises control should be covered by Indicators of Operational Performance; and
    b. Entities over which the organization exercises significant influence should be covered by Disclosures on Management Approach.
4) The boundaries for narrative disclosures should include entities over which the organization does not exercise control/significant influence, but which

Measurement of energy consumption is relevant to greenhouse gas emissions and climate change. The burning of fossil fuels to generate energy creates emissions of carbon dioxide (a greenhouse gas). To meet the aims formulated in the Kyoto Protocol and to reduce the risk of severe climate change, energy demand needs to be lowered. This can be achieved through more efficient energy use (measured under EN5 and EN6) and replacing fossil fuel energy sources with renewable ones (measured under EN3 and EN4). In addition to lowering the direct consumption of energy, designing energyefficient product and services (EN6) and reducing indirect energy consumption (EN7) (e.g., the selection of low energy-intensive raw materials or the use of services such as travel) are important strategies.

2. Emissions Aspect

The 'emissions, effluents, and waste' aspect includes Indicators that measure standard releases to the environment considered to be pollutants. These Indicators include different types of pollutants (e.g., air emissions, effluents, solid waste) that are typically recognized in regulatory frameworks (EN20-EN23, EN24). In addition, there are Indicators for two types of emissions that are the subject of international conventions- greenhouse gases (EN16 and EN17) and ozone depleting substances (EN19). EN16 can be calculated using the data reported under EN3 and EN4. EN18 addresses the emissions reductions achieved and initiatives to reduce emissions.

2.10.3 Definitions

1. Direct energy

Forms of energy that enter the reporting organization's operational boundaries. It can be consumed either by the organization within its boundaries, or it can be exported to another user. Direct energy can appear in either primary (e.g., natural gas for heating) or intermediate (e.g., electricity for lighting) forms. It can be purchased, extracted (e.g., coal, natural gas, oil), harvested (e.g., biomass energy), collected (e.g., solar, wind), or brought into the reporting organization's boundaries by other means.

2. Greenhouse gas emissions (GHG)

The six main greenhouse gas emissions are:

a. Carbon dioxide (CO2);
b. Methane (CH4);
c. Nitrous oxide (N2O);
d. Hydrofluorocarbons (HFCs- a group of several compounds);
e. Perfluorocarbons (PFCs- a group of several compounds); and
f. Sulphur hexafluoride (SF6).

3. Indirect energy

Energy produced outside the reporting organization's organizational boundary that is consumed to supply energy for the organization's intermediate energy needs (e.g., electricity or heating and cooling). The most common example is fuel consumed outside the reporting organization's

boundary in order to generate electricity to be used inside the organization's boundary.

4. Intermediate energy

Forms of energy that are produced by converting primary energy into other forms. For most organizations, electricity will be the only significant form of intermediate energy. For a small percentage of organizations, other intermediate energy products might also be important, such as steam or water provided from a district heating plant or chilled water plant, or refined fuels such as synthetic fuels, biofuels, etc.

5. Primary source

The initial form of energy consumed to satisfy the reporting organization's energy demand. This energy is used either to provide final energy services (e.g., space heating, transport) or to produce intermediate forms of energy, such as electricity and heat. Examples of primary energy include non-renewable sources such as coal, natural gas, oil, and nuclear energy. It also includes renewable sources such as biomass, solar, wind, geothermal, and hydro energy. Primary energy might be consumed on-site (e.g., natural gas to heat the reporting organization's buildings) or off-site (e.g., natural gas consumed by the power plants that provide electricity to the reporting organization's facilities).

6. Renewable energy

Renewable energy is derived from natural processes that are replenished constantly. This includes electricity and heat generated from solar, wind, ocean, hydropower, biomass, geothermal resources, biofuels, and hydrogen derived from renewable resources.

2.10.4 Guidelines for Quality Disclosure of Environment Indicator

1. EN1 Materials used by weight or volume.

a. Compilation

1) Identify total materials used, including materials purchased from external suppliers and those obtained from internal sources (captive production and extraction activities). This can include:
   a) Raw materials (i.e., natural resources used for conversion to products or services such as ores, minerals, wood, etc.);
   b) Associated process materials (i.e., material sthat are needed for the manufacturing process but are not part of the final product, such as lubricants for manufacturing machinery);
   c) Semi-manufactured goods or parts, including all forms of materials and components other than raw materials that are part of the final product; and
   d) Materials for packaging purposes.
2) Identify non-renewable and direct materials used. Convert any measurements into estimated weight or volume, calculated 'as is' rather than by 'dry substance/weight'.

3) Report the total weight or volume of :

a) Non-renewable materials used; and

b) Direct materials used.

b. Definitions

1) Direct materials : Materials that are present in a final product.

2) Non-renewable materials : Resources that do not renew in short time periods, such as minerals, metals, oil, gas, coal, etc.

2. EN2 Percentage of materials used that are recycled input materials.

a. Compilation

1) Identify the total weight or volume of materials used as reported under EN1.

2) Identify the total weight or volume of recycled input materials. If estimation is required, state the estimation methods.

3) Report the percentage of recycled input materials used by applying the following formula:

$$\text{EN2} = \frac{\text{Total recycled Input materials used}}{\text{Input materials Used}} \times 100$$

b. Definitions

Recycled input materials : Materials that replace virgin materials that are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the reporting organization.

3. EN3 Direct energy consumption by primary energy source.

a. Compilation

1) Direct energy sources purchased

Identify primary energy sources purchased by the reporting organization for its own consumption. This includes:

a) Direct non-renewable energy sources including:

1. Coal;
2. Natural gas; and
3. Fuel distilled from crude oil, including gasoline, diesel, liquefied petroleum gas (LPG), compressed natural gas (CNG), liquefied natural gas (LNG), butane, propane, ethane, etc.

b) Direct renewable energy sources including:

1. Biofuels;
2. Ethanol; and
3. Hydrogen.

Note: Biomass is excluded from direct renewable energy sources for the purpose of reporting to the WRI/WBCSD GHG Protocol. For alignment with the WRI/WBCSD GHG Protocol, direct CO2 emissions from the combustion of biomass should be reported separately.

2) Direct energy sources produced

Identify the amount of primary energy the reporting organization acquires by producing, extracting, harvesting, collecting, or converting it from other forms of energy into joules or multiples. This can include the same energy sources listed under 1).

3) Direct energy sources sold

Identify the amount of primary energy exported outside the reporting boundary in joules or multiples.

4) Calculate total energy consumption in joules or multiples such as gigajoules, using the following equation:

Total direct energy consumption = direct primary energy purchased + direct primary energy produced- direct primary energy sold

Refer to the following table to convert volumes of primary sources to gigajoules.

Table 2: Primary eneygy source volume

Coal	GJ	Crude Oil	GJ	Gasoline	GJ	Natural Gas	GJ	Electricity	GJ
tonne (metric)	26,00	barrel	6,22	US gallon	0,125	therm	0,1055	kilowatt-hour	0,0036
ton (short)	23,59	tonne (metric)	44,80	tonne (metric	44,80	1000 cubic feet	1,1046	megawatt-hour	3,6000
ton (long)	26,42	ton (short)	40,64	**Diesel**	..	1000 cubic meters	39,01	gigawatt-hour	3600,0
		ton (long)	45,52	US gallon	0,138	MMBtu	1,055		
				tonne (metric)	43,33				
				Fuel Oil					
				US gallon	0,144				
				tonne (metric)	40,19				

5) Report total direct energy consumption in joules or multiples by renewable primary source.

6) Report total direct energy consumption in joules or multiples by non-renewable primary source.

b. Definitions

Renewable resources means resources capable of being replenished within a short time through ecological cycles (as opposed to resources such as minerals, metals, oil, gas, coal that do not renew in short time periods).

4. EN4 Indirect energy consumption by primary source.

a. Compilation

1) Identify the amount of intermediate energy purchased and consumed from sources external to the reporting organization in joules or multiples, such as gigajoules (one billion joules, or 109 joules). This includes:

a) Intermediate energy purchased and consumed from non-renewable energy sources as listed under EN3, including:

1. Electricity;
2. Heating and Cooling
3. Steam;
4. Nuclear energy; and
5. Other forms of imported energy.

b) Intermediate energy purchased and consumed from renewable energy sources including:

1. Solar;
2. Wind;
3. Geothermal;
4. Hydro energy;
5. Biomass based intermediate energy; and
6. Hydrogen based intermediate energy.

2) Identify the amount of primary fuels consumed to produce intermediate energy based on the total amount of energy purchased from external suppliers (EN3- Energy Purchased). To estimate the fuels consumed to produce purchased energy, use either:

   a) Fuel consumption data acquired from the electricity provider if these data are available;

   b) Default data for electricity and heat; or

   c) Estimations where default figures are not available.

3) Using data from 2), report:

   a) The total amount of indirect energy used by indirect non-renewable sources and indirect renewable sources in terms of intermediate energy

   b) The corresponding primary energy consumed in its production.

   Note: The sum of primary energy sources (expressed in joules) used to generate intermediate energy will, depending on the primary source used, significantly exceed the amount of intermediate energy purchased (in joules) due to grid and efficiency losses when converting and transporting energy.

5. EN5 Energy saved due to conservation and efficiency improvements.

a. Compilation

1) Identify total energy saved by efforts to reduce energy use and increase energy efficiency. Reduced energy consumption from reduced

production capacity or outsourcing should not be included in this Indicator.

2) Report the total amount of energy saved in joules or multiples, such as gigajoules (one billion joules or 109 joules). Take into consideration energy saved due to:

a) Process redesign;

b) Conversion and retrofitting of equipment; and

c) Changes in personnel behavior.

b. Definitions

1) Energy saved

The reduced amount of energy needed to carry out the same processes or tasks. The term does not include overall reduction in energy consumption from reduced organizational activities (e.g., partial outsourcing of production).

2) Conservation and efficiency improvements

Organizational or technological innovations that allow a defined process or task to be carried out at a reducedlevel of energy consumption. This includes process redesign, the conversion and retrofitting of equipment (e.g., energy-efficient lighting), or the elimination of unnecessary energy use due to changes in behavior.

6. **EN6 Initiatives to provide energy efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives.**

a. Compilation

1) Report existing initiatives to reduce the energy requirements of major products/product groups or services.
2) Report quantified reductions in the energy requirements of products and services achieved during the reporting period.
3) If use-oriented figures are employed (e.g., energy requirements of a computer), clearly report any assumptions about underlying consumption patterns or normalization factors (e.g., 10% less energy use per average working day, assuming operation for 8 hours with changing processor load). Refer to available industry standards (e.g., fuel consumption of cars for 100 km at 90 km/h).

7. **EN7 Initiatives to reduce indirect energy consumption and reductions achieved.**

a. Compilation

1) For this Indicator, exclude indirect energy use associated with the purchase of intermediate energy sources as reported in EN4.
2) Identify relevant upstream/downstream indirect energy use in the following four areas:
   a) Use of energy-intensive materials;
   b) Subcontracted production;
   c) Business-related travel; and

d) Employee commuting.

3) Report initiatives to reduce indirect energy use.

4) Report quantitatively the extent to which indirect energy use has been reduced during the reporting period for the four areas listed in 2.2.

5) Indicate underlying assumptions and methodologies used to calculate other indirect energy use and indicate the source of information.

8. EN8 Total water withdrawal by source.

a. Compilation

1) Identify the total volume of water withdrawn from any water source that was either withdrawn directly by the reporting organization or through intermediaries such as water utilities. This includes the abstraction of cooling water.

2) Report the total volume of water withdrawn in cubic meters per year (m3/year) by the following sources:

a) Surface water, including water from wetlands, rivers, lakes, and oceans;

b) Ground water;

c) Rainwater collected directly and stored by the reporting organization;

d) Waste water from another organization; and

e) Municipal water supplies or other water utilities.

b. Definitions

Total water withdrawal is the sum of all water drawn into the boundaries of the reporting organization from all sources (including surface

water, ground water, rainwater, and municipal water supply) for any use over the course of the reporting period.

9. EN9 Water sources significantly affected by withdrawal of water.

a. Compilation

1) Identify water sources significantly affected by water withdrawal by the reporting organization. Significant withdrawals meet one or more of the following criteria:

a) Withdrawals that account for an average of 5 percent or more of the annual average volume of a given water body;

b) Withdrawals from water bodies that are recognized by professionals to be particularly sensitive due to their relative size, function, or status as a rare, threatened, or endangered system (or to their support of a particular endangered species of plant or animal); or

c) Any withdrawal from a Ramsar-listed wetland or any other nationally or internationally proclaimed conservation area regardless of the rate of withdrawal.

Note: If the water is provided by a public or private water supplier, the original water body/ source should be identified and reported.

2) Report the total number of significantly affected water sources by type according to the criteria above, indicating the following:

a) Size of water source in cubic meters (m3);

b) Whether or not the source is designated as a protected area (nationally and/or internationally); and

c) Biodiversity value (e.g., species diversity and endemism, number of protected species).

d) Value/importance of water source to local communities.

10. EN10 Percentage and total volume of water recycled and reused.

a. Compilation

1) This Indicator measures both water that was treated prior to reuse and water that was not treated prior to reuse. Grey water (i.e., collected rainwater and wastewater generated by household processes such as washing dishes, laundry, and bathing) is included.

2) Calculate the volume of recycled/reused water based on the volume of water demand satisfied by recycled/reused water rather than further withdrawals. For example, if the organization has a production cycle that requires 20 cubic meters of water per cycle, the organization withdraws 20 cubic meters of water for one production process cycle and then reuses it for an additional three cycles. The total volume of water recycled/ reused for that process is 60 cubic meters.

3) Report the total volume of water recycled/reused by the organization in cubic meters per year (m3/year) and also as a percentage of the total water withdrawal reported under Indicator EN8.

b. Definitions

Recycling/Reuse means the act of processing used water/wastewater through another cycle before discharge to final treatment and/or discharge to the environment. In general, there are three types of water recycling/re-use:

1) Wastewater recycled back in the same process or higher use of recycled water in the process cycle;
2) Wastewater recycled/re-used in a different process, but within the same facility; and
3) Wastewater re-used at another of the reporting organization's facilities.

11. EN11 Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.

a. Compilation

1) Identify operational sites owned, leased, managed in, located in, adjacent to, or that contain protected areas and areas of high biodiversity value outside protected areas. Include sites for which future operations have been formally announced.

2) Report the following information for each operational site identified above:

a) Geographic location;
b) Subsurface and/or underground land that may be owned, leased, or managed by the organization;
c) Position in relation to protected area (in the area, adjacent to, or containing portions of the protected area) and high biodiversity value area outside protected area;
d) Type of operation (office, manufacturing/ production, or extractive);
e) Size of operational site in km2;
f) Biodiversity value characterized by:

i. The attribute of the protected area and high biodiversity value area outside protected area (terrestrial, freshwater, or maritime ecosystem)

ii. Listing of protected status (e.g., IUCN Protected Area Management Category, Ramsar Convention, national legislation, Natura 2000 site, etc.)

b. Definitions

1) Protected area is a geographically defined area that is designated, regulated, or managed to achieve specific conservation objectives.

2) Areas of high biodiversity value is areas not subject to legal protection but recognized for important biodiversity features by a number of governmental and non-governmental organizations. These include habitats that are a priority for conservation (often defined in National Biodiversity Strategies and Action Plans prepared under the Convention on Biological Diversity). In addition, several international conservation organizations have identified particular areas of high biodiversity value.

12.EN12 Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.

a. Compilation

1) Identify significant impacts on biodiversity associated with activities, products, and services of the reporting organization, including both direct impacts as well as indirect impacts (e.g., in the supply chain).

2) Report the nature of significant direct and indirect impacts on biodiversity with reference to one or more of the following:

a) Construction or use of manufacturing plants, mines, and transport infrastructure;

b) Pollution (introduction of substances that do not naturally occur in the habitat from point and non-point sources);

c) Introduction of invasive species, pests, and pathogens;

d) Reduction of species;

e) Habitat conversion; and

f) Changes in ecological processes outside the natural range of variation (e.g., salinity or changes in groundwater level).

3) Report significant direct and indirect positive and negative impacts with reference to the following:

a) Species affected;

b) Extent of areas impacted (this may not be limited to areas that are formally protected and should include consideration of impacts on buffer zones as well as formally designated areas of special importance or sensitivity);

c) Duration of impacts; and

d) Reversibility or irreversibility of the impacts.

b. Definitions

Significant impact is impacts that may adversely affect the integrity of a geographical area/region, either directly or indirectly. This occurs by substantially changing its ecological features, structures, and functions across

its whole area and over the long term. This means that the habitat, its population level, and/or the particular species that make that habitat important cannot be sustained.

On a species level, a significant impact causes a population decline and/or change in distribution so that natural recruitment (reproduction or immigration from unaffected areas) cannot return to former levels within a limited number of generations. A significant impact can also affect subsistence or commercial resource use to the degree that the well-being of users is affected over the long term.

13. EN13 Habitats protected or restored.

a. Compilation

1) This Indicator refers to areas in which remediation has been completed or the area is actively protected (see Definitions). Areas in which operations are still active can be counted if they conform to the definitions of 'restored' or 'protected'.

2) Assess the status of the area based on its condition at the close of the reporting period.

3) Report the size and location of all habitat protected areas and/or restored areas (in hectares), and whether the success of the restoration measure was/is approved by independent external professionals. If the area is larger than one km2, report in km2.

4) Report whether partnerships exist with third parties to protect or restore habitat areas distinct from where the organization has overseen and implemented restoration or protection measures.

b. Definitions

1) Area restored

Areas that were used during or affected by operational activities, and where remediation measures have either restored the environment to its original state or to a state where it is a healthy and functioning ecosystem.

2) Area protected

Areas that are protected from any harm during operational activities, and the environment remains in its original state with a healthy functioning ecosystem.

14. EN14 Strategies, current actions, and future plans for managing impacts on biodiversity.

a. Compilation

1) If national regulations have influenced the specific strategies, actions, or plans reported under this Indicator, this should be noted.

2) Report the organization's strategy for achieving its policy on biodiversity management including:

a) Integration of biodiversity considerations in analytical tools such as environmental site impact assessments;

b) Engagement with relevant stakeholders;

c) Methodology for establishing risk exposure to biodiversity;

d) Setting specific targets and objectives;

e) Monitoring processes; and

f) Public reporting.

3) Report actions underway to manage biodiversity risks identified in EN11 and EN12, or plans to undertake such activities in the future.

15. EN15 Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.

a. Compilation

1) Identify the location of habitats affected by the operations of the reporting organization that include species on the IUCN Red List and on national conservation lists.

2) Report the number of species in habitats identified as affected by the reporting organization, indicating one of the following levels of extinction risk:

a) Critically endangered;

b) Endangered;

c) Vulnerable;

d) Near threatened; and

e) Least concern.

b. Definitions

IUCN Red List species is an inventory of the global conservation status of plant and animal species developed by the International Union for the Conservation of Nature and Natural Resources (IUCN).

16. EN16 Total direct and indirect greenhouse gas emissions by weight.

a. Compilation

1) Different conversion methodologies are available to calculate the amount of greenhouse gas emissions per source. Indicate the standard used, and indicate the methodology associated with the data with reference to the following categories:

a) Direct measurement (e.g., continuous online analyzers, etc.);

b) Calculation based on site specific data (e.g., for fuel composition analysis, etc.);

c) Calculation based on default data; and

d) Estimations. If estimations are used due to a lack of default figures, indicate which basis figures were obtained.

Further details on the compilation of this Indicator are available in the WRI /WBCSD GHG Protocol and in the IPCC document as listed under references.

2) Identify direct emissions of greenhouse gases from all sources owned or controlled by the reporting organization, including:

a) Generation of electricity, heat, or steam (as reported in EN3);

b) Other combustion processes such as flaring;

c) Physical or chemical processing;

d) Transportation of materials, products, and waste;

e) Venting; and

f) Fugitive emissions.

Emissions from combustion processes and sources will correspond to the direct primary energy from non-renewable and

renewable sources as reported in EN3. Note that the direct CO2 emissions from the combustion of biomass shall not be included but reported separately under GHG Protocol Corporate Standard (revised edition).

3) Identify indirect emissions of greenhouse gases resulting from the generation of purchased electricity, heat, or steam (this corresponds with energy consumption reported under EN4). Other indirect emissions (e.g., from organizational travel) are not included since they are accounted for in EN17.

4) Report total greenhouse gas emissions as the sum of direct and indirect emissions (as identified in 2) and 3)) in tonnes of CO2 equivalent.

b. Definitions

1) Direct emissions

Emissions from sources that are owned or controlled by the reporting organization. For example, direct emissions related to combustion would arise from burning fuel for energy within the reporting organization's operational boundaries.

2) Indirect emissions

Emissions that result from the activities of the reporting organization but are generated at sources owned or controlled by another organization. In the context of this Indicator, indirect emissions refer to greenhouse gas emissions from the generation of electricity, heat, or steam that is imported and consumed by the reporting organization.

3) Carbon dioxide equivalent

CO2 (Carbon Dioxide) equivalent is the measure used to compare the emissions from various greenhouse gases based on their global warming potential (GWP). The CO2 equivalent for a gas is derived by multiplying the tonnes of the gas by the associated GWP.

17. EN17 Other relevant indirect greenhouse gas emissions by weight.

a. Compilation

1) Identify the greenhouse gas emissions resulting from indirect energy use. Exclude indirect emissions from imported electricity, heat, or steam, as these are covered by EN16.

2) Additionally, identify which of the reporting organization's activities cause indirect emissions and assess their amounts (e.g., employee commuting, business travel, etc).

When deciding on the relevance of these activities, consider whether emissions of the activity:

a) Are large compared to other activities generating direct emissions or energy related indirect emissions (as reported in EN16);

b) Are judged to be critical by stakeholders;

c) Could be substantially reduced through actions taken by the reporting organization.

3) Report the sum of indirect GHG emissions identified in tonnes of CO2 equivalent.

18. **EN18 Initiatives to reduce greenhouse gas emissions and reductions achieved.**

a. Compilation

1) Identify emissions reductions from all sources owned or controlled by the reporting organization as reported under EN16 and resulting from indirect energy use and activities of the reporting organization as reported under EN17. Distinguish between mandatory and voluntary emissions reductions.

2) Report initiatives to reduce greenhouse gas emissions, include the areas where the initiatives were implemented.

3) Report quantitatively the extent greenhouse gas emissions reductions achieved during the reporting period as a direct result of the initiative(s) in tonnes of CO2 equivalent.

19. **EN19 Emissions of ozone-depleting substances by weight.**

a. Compilation

1) Ozone-depleting substances contained or emitted from products during their usage and disposal are not covered by this Indicator.

2) Emissions of substances covered in Annexes A, B, C, and E of the Montreal Protocol on Substances that Deplete the Ozone Layer are included.

3) Identify emissions of ozone-depleting substances using the following formulas:

Emissions = Production + Imports- Exports of Substances Production = Substances Produced- Substances Destroyed by Technology-Substances used entirely as feedstock in the manufacture of other chemicals

Note: ODS that is recycled and reused is not considered production.

4) Report the emissions of specific ozone-depleting substances in tonnes and tonnes of CFC-11 equivalent.

b. Definitions

1) Ozone-depleting substance (ODS)

Any substance with an ozone depletion potential (ODP) greater than 0 that can deplete the stratospheric ozone layer. Most ozone-depleting substances are controlled under the Montreal Protocol and its amendments, and include CFCs, HCFCs, halons, and methyl bromide.

2) CFC-11 equivalent

CFC-11 is a measure used to compare various substances based on their relative ozone depletion potential. The reference level of 1 is the potential of CFC-11 and CFC-12 to cause ozone depletion.

20. EN20 NOx, SOx, and other significant air emissions by type and weight.

a. Compilation

1) Identify significant air emissions and calculate their weight.

2) Since calculating certain air emissions such as Nox requires complex quantification efforts, indicate the methodology used for calculations, selecting one of the following approaches:

a) Direct measurement of emissions (e.g., online analyzers, etc.);

b) Calculation based on site specific data;

c) Calculation based on default data; or

d) Estimation (if estimations are used due to a lack of default figures, indicate on what basis figures were obtained).

3) Report the weight of significant air emissions (in kilograms or multiples such as tonnes) for each of the following categories:

a) NOx;

b) SOx;

c) Persistent organic pollutants (POP);

d) Volatile organic compounds (VOC);

e) Hazardous air pollutants (HAP);

f) Stack and fugitive emissions;

g) Particulate matter (PM); or

h) Other standard categories of air emissions identified in regulations.

b. Definitions

Significant air emissions is air emissions that are regulated under international conventions and/or national laws or regulations, including those listed on environmental permits for the reporting organization's operations.

21. EN21 Total water discharge by quality and destination.

a. Compilation

1) Identify planned and unplanned water discharges (excluding collected rainwater and domestic sewage) by destination and indicate how it is treated. If the reporting organization does not have a meter to measure water discharges, this figure needs to be estimated by subtracting theapproximate volume consumed on-site from the volume withdrawn as reported in EN8.

2) Report the total volume of planned and unplanned water discharges in cubic meters per year (m3/year) by:

   a) Destination;

   b) Treatment method; and

   c) Whether it was reused by another organization.

3) Reporting organizations that discharge effluents or process water should report water quality in terms of total volumes of effluent using standard effluent parameters such as Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), etc. The specific choice of quality parameters will vary depending on the organization's products/ services/operations. The selection of parameters should be consistent with those used in theorganization's sector.

Clean water refers to water that meets national regulations for freshwater quality when leaving the boundaries of the reporting organization. This can be either freshwater whose quality has not been affected by the organization's use, or wastewater that is treated to meet freshwater standards prior to discharge.

b. Definitions

Total water discharge is the sum of water effluents discharged over the course of the reporting period to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water either through:

a) A defined discharge point (point source discharge)

b) Over land in a dispersed or undefined manner (non-point source discharge)

c) Wastewater removed from the reporting organization via truck. Discharge of collected rainwater and domestic sewage is not regarded as water discharge.

22. EN22 Total weight of waste by type and disposal method.

a. Compilation

1) Identify the amount of waste created by the organization's operations, by:

a) Hazardous waste (as defined by national legislation at the point of generation); and

b) Non-hazardous waste (all other forms of solid or liquid waste excluding wastewater).

2) If no weight data are available, estimate the weight using available information on waste density and volume collected, mass balances, or similar information.

3) Report the total amount of waste in tonnes by type as identified in 2.1 for each of the following methods:

a. Reuse;
b. Recycling;
c. Composting;
d. Recovery, including Energy Recovery;
e. Other (to be specified by the reporting organization).
f. Incineration (mass burn);
g. Landfill;
h. Deep well injection;
i. On-site storage; and

4) Report how the method of disposal has been determined:

a) Disposed directly by the reporting organization or otherwise directly confirmed;
b) Information provided by the waste disposal contractor; or
c) Organizational defaults of the waste disposal contractor.

b. Definitions

Disposal method is the method by which waste is treated or disposed, including composting, reuse, recycling, recovery, incineration, landfill, deep well injection, and on-site storage.

23. EN23 Total number and volume of significant spills.

a. Compilation

1) Identify all recorded significant spills and the volume of these spills.
2) Report the total number and total volume of recorded significant spills.
3) For spills that were reported in the organization's financial statement, report the additional following information for each such spill:

a) Location of spill;

b) Volume of spill; and

c) Material of spill, categorized by:

i. Oil spills (soil or water surfaces);

ii. Fuel spills (soil or water surfaces);

iii. Spills of wastes (soil or water surfaces);

iv. Spills of chemicals (mostly soil or water surfaces); and

v. Other.

4) Report the impacts of significant spills.

b. Definitions

1) Spill

Accidental release of a hazardous substance that can affect human health, land, vegetation, water bodies, and ground water.

2) Significant spill

All spills that are included in the reporting organization'sfinancial statement (e.g., due to resulting liabilities) or recorded as a spill by the reporting organization.

24. EN24 Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.

a. Compilation

1) Identify hazardous wastes transported by or on behalf of the reporting organization within the reporting period by destination.

2) Identify the total weight of transported hazardous waste using the following equation:

Total weight of hazardous waste transported by destination = Weight of hazardous waste transported to the reporting organization by destination from external sources/suppliers not owned by the reporting organization + Weight of hazardous waste transported from the reporting organization by destination to external sources/suppliers not owned by the reporting organization + Weight of hazardous waste transported nationally and/or internationally by destination between locations owned, leased, or managed by the reporting organization

3) Identify the total weight of hazardous waste transported across international borders and which enters the boundaries of the reporting organization, by destination. Waste transported between different locations of the organization is not counted as imported.

4) Identify the proportion of the total amount of transported hazardous waste by destination that is transported from the reporting organization to locations abroad. Include all wastes that leave the boundaries of the reporting organization to cross international borders, excluding transportation between different locations of the reporting organization.

5) Identify the portion of the total amount of transported and exported waste by destination that the organization has treated.

6) Identify the portion of the total amount of waste by destination that is treated by external sources/ suppliers, that has been transported, exported, or imported by the organization.

7) Convert volumes to an estimate of weight with a brief explanation of the methodology used.

8) Report the following information in kilograms ortonnes:

a) Total weight of hazardous waste transported;

b) Total weight of imported hazardous waste;

c) Total weight of exported hazardous waste; and

d) Total weight of treated hazardous waste.

25. **EN25 Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.**

a. Compilation

1)Identify water bodies significantly affected by the reporting organization's water discharges that meet one of more of the following criteria:

a) Discharges account for an average of 5% or more of the annual average volume of the water body;

b) Discharges that, on the advice of appropriate professionals (e.g., municipal authorities), are known to have or are highly likely to have significant impacts on the water body and associated habitats;

c) Discharges to water bodies that are recognized by professionals to be particularly sensitive due to their relative size, function, or status as a rare, threatened, or endangered system (or support a particular endangered species of plant or animal); or

d) Any discharge to a Ramsar-listed wetland or any other nationally or internationally proclaimed conservation area regardless of the rate of discharge.

2) Report water bodies significantly affected by water discharges based on the criteria above, adding information on:

a) Size of water body in cubic meters (m3);

b) Whether the source is designated as a protected area (nationally and/or internationally); and

c) Biodiversity value (e.g., number of protected species).

26. EN26 Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.

a. Compilation

1) In this Indicator, the following impacts are excluded since they are covered in other Environmental Indicators:

a) reclaiming of products and product packaging (EN27); and

b) Impacts on biodiversity (EN12).

2) Report initiatives in the reporting period to mitigate the most significant environmental impacts of products/service groups in relation to:

a) Materials use (e.g., use of non-renewable, energy-intensive, toxic materials);

b) Water use (e.g., volumes used during production and/or use);

c) Emissions (e.g., GHG, toxic, ozone-depleting emissions);

d) Effluents (e.g., quality of water used during production and/or use);

e) Noise; and

f) Waste (e.g., non-reclaimable, toxic materials/ compounds).

3) Report quantitatively the extent to which environmental impacts of products and serviceshave been mitigated during the reporting period. If use-oriented figures are employed (e.g., water use of washing machine), clearly indicate the underlying assumptions regarding consumptionpatterns or normalization factors (e.g., 10% lesswater use per 5 kg of laundry).

27. EN27 Percentage of products sold and their packaging materials that are reclaimed by category.

a. Compilation

1) Identify the amount of products and their packaging materials reclaimed (i.e., recycled or reused) at the end of their useful life within the reporting period. Rejects and recalls of products should not be counted. Recycling or reuse of packaging should also be reported separately.

2) Report the percentage of reclaimed products and their packaging materials for each category of products (i.e., a group of related products sharing a common, managed set of features that satisfy the specific needs of a selected market) using the following formula:

$$\% \text{ of reclaimed product} = \frac{\text{products and their packaging materials reclaimed within the reporting period}}{\text{Product within the reporting period}} \times 100$$

3) Given potential variations in data sources, report how the data for this Indicator has been collected (e.g., data is gathered from an internal collection system or data is provided by external collection systems reclaiming products on behalf of the organization).

b. Definitions

Reclaimed, refers to collecting, reusing, or recycling products and their packaging materials at the end of their useful life. Collection and treatment can be carried out by the manufacturer of the product or by a contractor. This refers to products and their packaging materials that are:

1) Collected by or on behalf of the reporting organization;
2) Separated into raw materials (e.g., steel, glass, paper, some kinds of plastic, etc.) or components; and
3) Used by the reporting organization or other users.

28. EN28 Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.

a. Compilation

1) Identify administrative or judicial sanctions for failure to comply with environmental laws and regulations, including:
   a) International declarations/conventions/ treaties, and national, sub-national, regional, and local regulations. Include non-compliances related to spills as disclosed under EN23 that meet the criteria for EN28;

b) Voluntary environmental agreements with regulating authorities tht are considered binding and developed as a substitute for implementing new regulations. In certain jurisdictions, such agreements are referred to as 'covenants'; and

c) Cases brought against the organization through the use of international dispute mechanisms or national dispute mechanisms supervised by government authorities.

2) Report significant fines and non-monetary sanctions in terms of:

a) Total monetary value of significant fines;

b) Number of non-monetary sanctions; and

c) Cases brought through dispute resolution mechanisms.

3) Where reporting organizations have not identified any non-compliance with laws or regulations, a brief statement to this fact is sufficient.

b. Definitions

Environmental laws and regulations

Refers to regulations related to all types of environmental issues (i.e., emissions, effluents, and waste, as well as material use, energy, water, and biodiversity) applicable to the reporting organization. This includes binding voluntary agreements that are made with regulatory authorities and developed as a substitute for implementing a new regulation. Voluntary agreements can be applicable if the reporting organization directly joins the agreement or if public agencies make the agreement applicable to organizations in their territory through legislation or regulation.

29. EN29 Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.

a. Compilation

1) Identify the significant environmental impacts of the modes of transportation used by the organization, including:

a) Energy use (e.g., oil, kerosene, fuel, electricity);

b) Emissions (e.g., greenhouse gas emissions, ozone-depleting substances, NOx, SOx, and other air emissions);

c) Effluents (e.g., different kinds of chemicals);

d) Waste (e.g., different types of packaging material);

e) Noise; and

f) Spills (e.g., spills of chemicals, oils, and fuels).

2) Report the significant environmental impacts of transportation used for logistical purposes and for transportation of members of the organization's workforce. Where quantitative data is not stated in the report, disclose the reason.

3) Indicate the criteria and methodology used to determine which environmental impacts are significant.

4) Report how the environmental impacts of transporting products, members of the organization's workforce, and other goods and materials are mitigated.

b. Definitions

1) Transportation

The act of transferring resources and goods from onelocation to another (between suppliers, productionplants, warehouses, and the customer) using different modes of transport, including passenger transportation(e.g., employee commuting and business traveling).

2) Logistical purposes

The forward or reverse flow and storage of goods and services between the point of origin and the point of consumption.

3) Transportation of the members of the organization's workforce

Transportation used for commuting to work by members of the workforce or travel for business purposes including air, train, bus, and other forms of motorized and non-motorized travel.

30. EN30 Total environmental protection expenditures and investments by type.

a. Compilation

1) The compilation of the expenditures in this Indicator should exclude the following categories as defined in the IFAC 'International Guidance Document on Environmental Management Accounting' document:

a) Costs of non-product output; and

b) Fines for non-compliance with environmental regulation.

2) Identify waste disposal, emissions treatment, and remediation costs based on expenditures related to the following items:

a) Treatment and disposal of waste;

b) Treatment of emissions (e.g., expenditures for filters, agents);

c) Expenditures for the purchase and use of emissions certificates;

d) Depreciation of related equipment, maintenance, and operating material and services, and related personnel costs;

e) Insurance for environmental liability; and

f) Clean-up costs, including costs for remediation of spills as reported in EN23.

3) Identify prevention and environmental management costs based on expenditures related to the following items:

a) Personnel employed for education and training;

b) External services for environmental management;

c) External certification of management systems;

d) Personnel for general environmental management activities;

e) Research and development;

f) Extra expenditures to install cleaner technologies (e.g., additional cost beyond standard technologies);

g) Extra expenditures on green purchases; and

h) Other environmental management costs.

4) Report total environmental protection expenditures broken down by:

a) Waste disposal, emissions treatment, and remediation costs; and

b) Prevention and environmental managementcosts.

b. Definitions

Environmental protection expenditures

All expenditures on environmental protection by the reporting organization, or on its behalf, to prevent, reduce, control, and document environmental aspects, impacts, and hazards. It also includes disposal, treatment, sanitation, and clean-up expenditure.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Object of Research

The object of this research is the disclosure of environmental indicator in Sustainability Report PT. Timah (Persero) Tbk. Author chooses PT. Timah (Persero) Tbk as the research object because this company is the big company in Indonesia which have wide operations with utilizing environmental resources excessively. In company sustainability report which based on GRI standard, authors found the environmental indicators which covers company performance related to input (e.g. material, energy and water) and output (emissions, effluents, and waste), beside that they also covers company performance related to biodiversity, environmental compliance and other relevant information such as product, service and overall.

The other factor that motivate author to choose PT. Timah (Persero) Tbk as the research object is because in their sustainability report this company presented their environmental indicators directly in the backed using red colour, eg (EN1) after each environmental performance reported. So it assist author to evaluate each company environmental indicators easily and accurately. Then, as the standard to analyze and evaluate the disclosure level of environmental indicator in that company author used the Sustainability Report Guidelines version 3.1 (2000-2011) developed by Global Reporting Initiative (GRI).

3.2 Type of Research

This research is case study research. Yin (2003) provides the technical definition of a case study as follows:

case study is an empirical inquiry that Investigate a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

According to Yin (2003), the case studies is a suitable strategy when the principal questions of a study regarding the question how or why, if the researcher had little opportunity to control the events that will be investigated, and where the research focus lies in the contemporary phenomenon in real life.

The author is guided by the concept of Yin's case study by the following reasons:

1. Relationship between the focus that occurs more appropriate when the analysis using a case study, because attempts to give an actual picture of the phenomenon at hand.
2. Facilitate the author looked at the problem as a particular object that must be examined in greater detail and depth (holistic).

In addition, in order to categorize the type of research, author also refer the book of Supranto (2003). According to Supranto this research is descriptive and applied research.

1. Based on the degree of explanation this research classified as descriptive research because author elaborates the evaluation process of disclosure level of environmental indicator PT. Timah (Persero) Tbk. By using this descriptive

method writer can find the fact and then analyze the collected data about the object of research.

2. This research is applied research because developed to practical reason. Practical reason means the reason based on desires to know something in order to do something better, efficient and effective.

3.3 Type of Data

The data used for this research is secondary data, which refer to information gathered from source already existing (Sekaran, 2003). All data are gathered from PT. Timah (Persero) Tbk Sustainability Report year 2010. Author decided to use single year because the intention of this research is focuss on the evaluation of discosure level in that company's sustainability report year 2010 wether it accordanced to GRI 3.1. Report year 2010 is chooses because as the newest company's sustainability report it is more interested to be research.

The secondary data which collected are:

1. Company profile
2. Business process of sustainability report
3. The disclosure of environmental indicators

The secondary data which also gathered from Global Reporting Initiative (GRI) Sustainability Report Guideliness are:

1. Sustainability reporting
2. Environmental disclosure
3. GRI 3.1 Checklist

Author collects the data for studying and analyzing the environmental awareness and quality report of that company compare with the standard requirement of GRI Sustainability Reporting Guideliness.

3.4 Data Gathering Method

The data gathering method that author used in this research is literatur survey. Literatur survey is the documentation of a comprehensive review of the published and unpublished work from secondary resources of data in the areas of specific interest to the researcher.(Sekaran, 2003) This research developed by using the data from Sustainability Report PT.Timah (Persero) Tbk year 2010. In order to analyze the problems faced in this writing we need a set of relevant data that could give a description of the condition to be elaborate. So, author also used GRI Sustainability Report Guideliness to evaluate the quality of that company report.

Those data above was founded from websites. To support the theory related to research broad problem author also collect any other data from websites, included accounting journals, previous research, etc. Most of those data also intended as research references.

As guidance, the books also used to this research, most of them are about accounting and management study. The other books are research methodology and the book which have particular description topic with research broad problem area.

3.5 Data Analysis

The author analyzes data by learning how the company implement GRI standard. Research method that author used in evaluate the level of environmental indicator disclosures is as followed:

1. First, in order to analyze the object to be researched, author finds the sustainability report of PT. Timah (Persero) Tbk year 2010. This company has published their report in websites. Related to this research, authors find that the report has been composed in accordance with the Sustainability Reporting Guidelines Version 3.0 published by the Global Reporting Initiative (GRI).

2. Second, author discovered the environmental aspect presented in that company's report supported by company's environmental performance indicators. The company sustainability report year 2010 has presented all of the company's sustainability performance indicator. However, this research is just focus on the environmental performance indicators, so thats the most important content to be discovered by author.

3. Third, find the disclosure for each environmental indicator. In order to assist the reader in finding out more about the Company's performance in specific aspects within the report, they have included a concise description of the reporting prerequisites as stipulated by GRI guidelines. The indices serve as a crossreferencing tool for the reader. In addition, they have also presented the GRI indicators throughout the pages of the report in yellow type and in brackets at the end of every paragraph or section title that pertains to specific criteria in the GRI Guidelines. So, it helps author to find the disclosure for each environmental indicators easily.

4. Fourt steps, evaluate the adequacy of disclosures. Author evaluate the adequacy of each disclosure of environmental performance indicators by using GRI Guidelines version 3.1 as presented in Appendix 3. The indicator protocols set environment (EN) is usefull as a guidance to analyze each of environmental indicator disclosures of company.

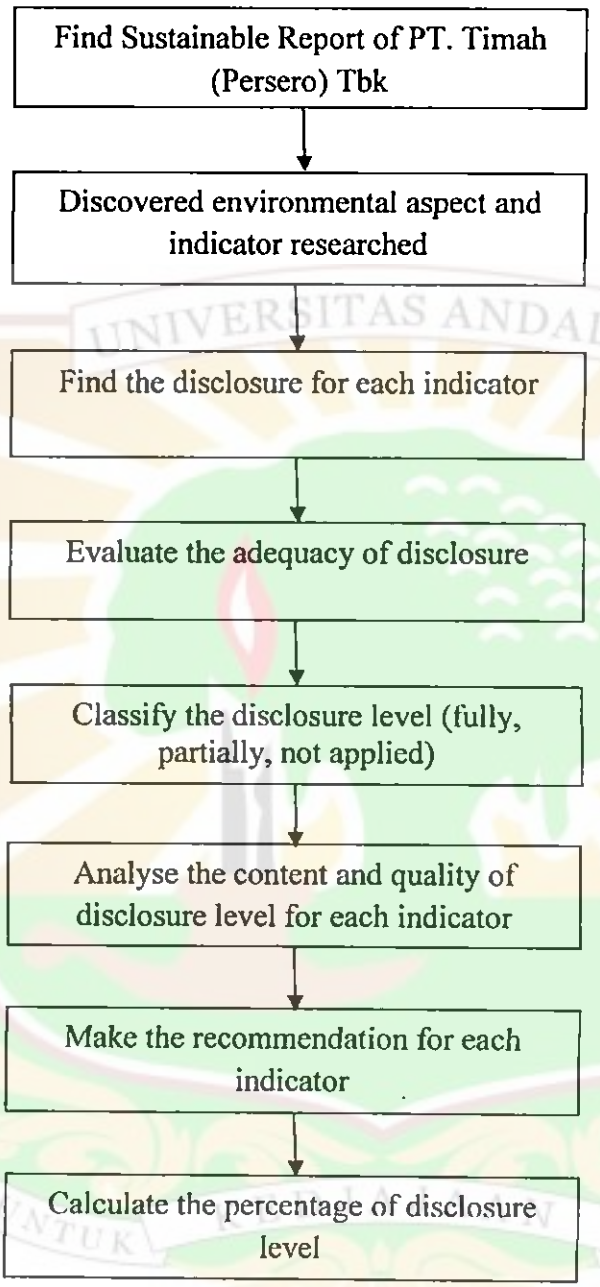
5. Fifth, classify disclosure level of indicators. After find the adequacy of each disclosure, author can classify the disclosure level. Each of indicator classified into fully, partially, or not applied.

6. Sixth step, as a evaluation, author analyze the content and quality for disclosure level for each indicator. As the evaluation, author find the the factors motivate the company applied the GRI in fully, partially or even not applied.

7. Seventh step, author make a recommendation for each indicator. After evaluate each indicator level, author make recommendation based on the law, regulation and guidelines of environmental performance indicator required for company.

8. Finally, as the final result of evaluation of disclosure level, author calculate the total of each disclosure level and presented in percentage (%).

Figure 2 : The data analysis of research



CHAPTER IV

RESEARCH RESULT AND ANALYSIS

4.1 Company Profile

4.1.1 Company Milestones

1. 1953-19581

   Three tin mining companies from the Netherlands, i.e. "Banka Tin Winning Bedrijf" (BTW), "Gemeenschappelijke Mijnbouwmaatschappij Billiton" (GMB) and "NV Singkep Tin Exploitatie Maatschappij" (NV SITEM), are nationalized into PN Tambang Timah Bangka, PN Tambang Timah Belitung and PN Tambang Timah Singkep, respectively.

2. 1961

   Badan Pimpinan Umum Perusahaan Tambang-tambang Timah Negara (BPU PN Tambang Timah) or the Head Governing Body for the State's Tin Mining Companies, is established to coordinate the three companies mentioned above.

3. 1968

   The three mining companies are combined into a business entity with the name of Perusahaan Negara (PN) Tambang Timah.

4. 1976

   The status of PN Tambang Timah and Proyek Pelcburan Timah Mentok is changed into Perusahaan Perseroan (Persero), or a Limited Liability Company, whose stocks are fully owned by the Government of the Republic of Indonesia. The name is also changed to PT Tambang Timah (Persero).

5. 1995

PT Tambang Timah (Persero) lists its shares on the Jakarta Stock Exchange, Surabaya Stock Exchange, and changes its name into PT Timah (Persero) Tbk.

6. 1998

PT Timah (Persero) Tbk separates its business activities to 3 (three) subsidiaries, namely PT Timah Eksplomin, PT Tambang Timah, and PT Timah Industri.

7. 2003

The Company introduces its latest product, rounded tin shot, to international markets.

8. 2004

The Company acquires 100% ownership of PT Tanjung Alam Jaya, a company that has signed the Coal Contract of Work (PKP2B) and is operating commercially.

9. 2005

The Company carries out its initial export of 6,500 metric tons of tin produced by the new smelter in Kundur, with the ceremony attended by 4 Ministers of the United Indonesia Cabinet.

10. 2006

The Company reestablishes its efforts for post-mining land reclamation, which since 2001 have been halted due to the proliferation of illegal tin mining practices.

11. 2007

The Company receives the 2007 Indonesia Sustainability Reporting Award (ISRA) for the Commendation for Sustainability Reporting, First Time Sustainability Report 2006, bestowed by the Association of Indonesian Accountants – Accountants Compartment.

12. 2009

The Company receives the 2007 Indonesia Sustainability Reporting Award (ISRA) for the Commendation for Sustainability Reporting, First Time Sustainability Report 2006, bestowed by the Association of Indonesian Accountants – Accountants Compartment

13. 2010

The Company sets out to intensify its offshore mining activities in order to improve its productivity, to deal more intensely with illegal mining practices, and to enhance the quality and performance of its human resources.

4.1.2 Company Vision, Mission and Values

In accordance with the stipulations for the implementation of corporate governance principles as stated in the Indonesian General Guidelines for Good Corporate Governance, PT Timah (Persero) Tbk as a public company is earnestly employing the principles of corporate governance in conducting all of its business activities.

In order to realize its vision, i.e. becoming a world-class mining company and the global tin market leader, PT Timah (Persero) Tbk is committed to implementing the highest standards of good corporate governance (GCG) principles within the entire Company without exception.

With the consistent enactment of GCG principles, it is hoped that all the benefits and values crucial for business sustainability may be felt by all stakeholders.

The Company's Vision, Mission, and Values are thus described below.

1. Vision

   Becoming a world-class mining company and the global tin market leader.

2. Mission

   a. Optimizing Corporate Values, Contributing to Shareholders, and Being Socially Responsible.

   b. Building Competent Human Resources that Possess Integrity, Creativity and Positive Values

   c. Establishing Harmonious Relationships with Related Parties (Stakeholders)

3. Value

   a. Work Culture
      1) Togetherness
      2) Openness
      3) Cleanliness

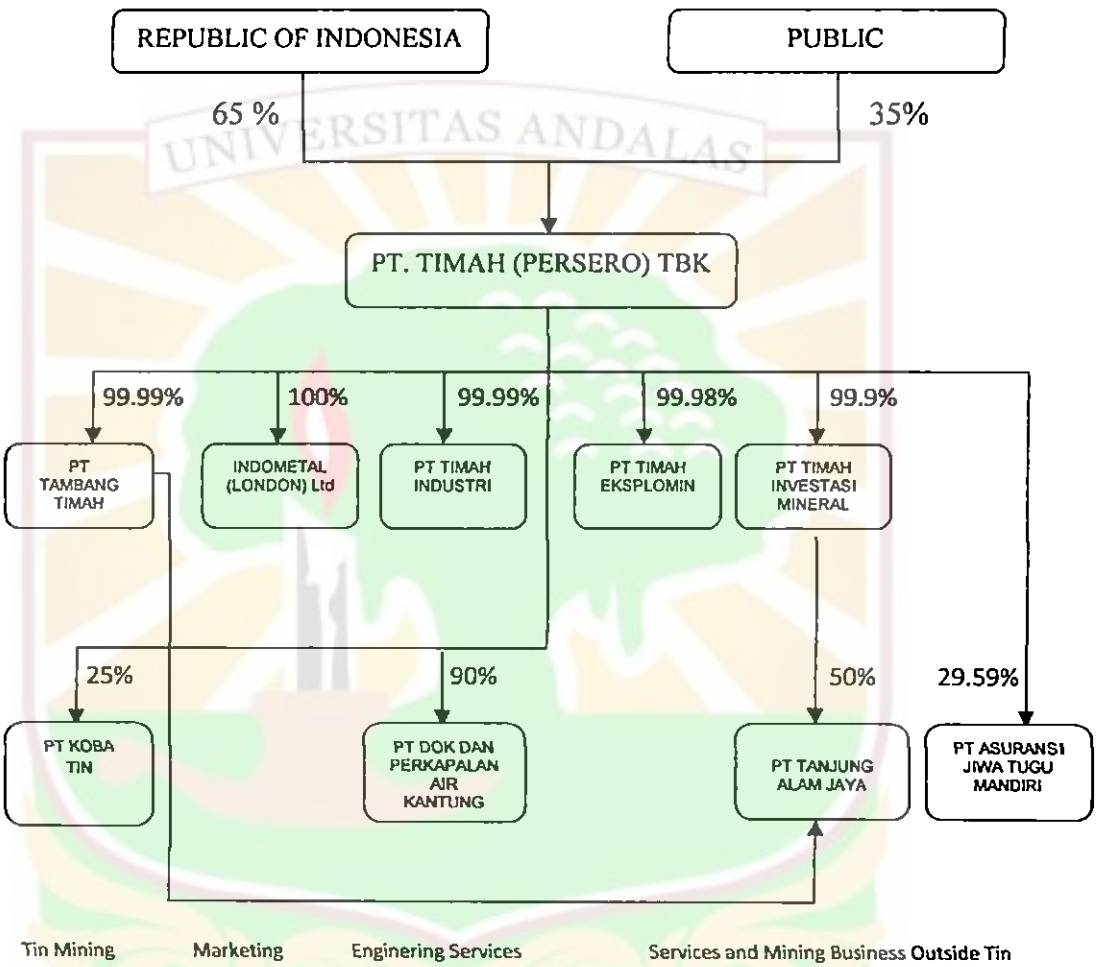
   b. Work Ethos
      1) Hard Work
      2) Honest Work
      3) Team Work

   c. Work Attitude
      1) Faithful
      2) Extrovert
      3) Positive
      4) Rational
      5) Cost-conscious

4.1.3 Company Business Activity

1. Corporate structure

Figure 3: Corporate Structure of PT.Timah (Persero) Tbk

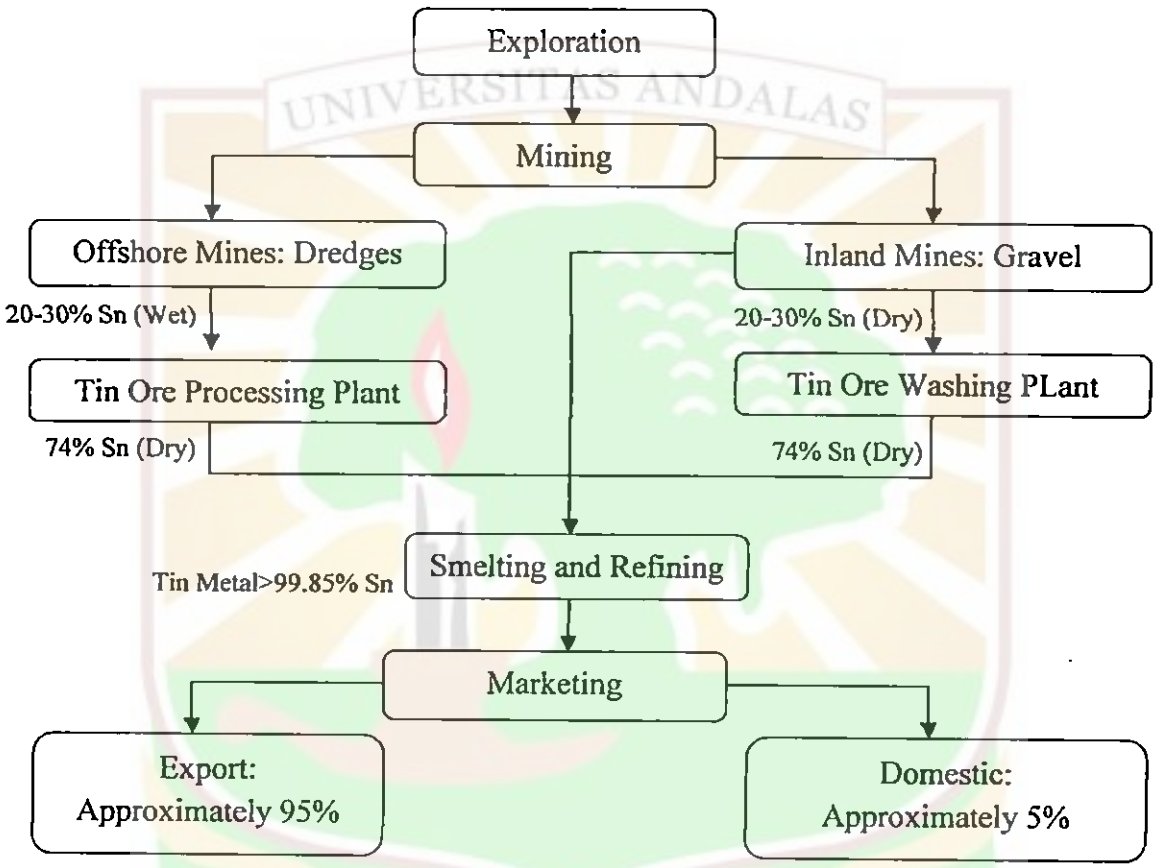


PT Timah (Persero) Tbk is a company whose main business activities are associated with the tin mining industry. The Company is headquartered in Pangkalpinang, Bangka Belitung Archipelago, Indonesia. Currently the Company is the second largest tin producer and the largest tin exporter in the world, with six subsidiaries and participation in four other business entities. The Company's business activities are categorized into four principal business elements, as depicted in the Corporate Structure chart above. The four elements are:

a. Tin Mining
b. Marketing
c. Engineering Services
d. Services and Mining Businesses Outside Tin

2. Intcgratcd Tin Mining Activitics

Figure 4: Integrated Tin Mining Activities



The Company engages in mining activitics that arc conducted within thc areas designated as Mining Permit Areas (*Izin Usaha Pertambangan*—IUP) for tin, which the Company possesses in Bangka and Belitung. Meanwhile, the Company also operates through its subsidiary, PT Tambang Timah, that holds IUPs in Kundur, Riau Archipelago.

Tin is the primary product of the Company's mining activities. However, there are a number of associated minerals that are produced, namely zircon, ilmenite, monazite and xenotime.

Tin mining is an integrated and continuous business segment, which encompasses exploration, mining, processing, smelting and marketing activities.

a. Exploration

Exploration covers a series of activities that include reviewing and systematically analyzing certain regions in order to discover and measure the amount of tin ore reserve contained in such regions. Exploration activities consist of several processes, from mapping or preliminary surveys, sampling by underground drilling technique, laboratory analysis, to geological (final) mapping.

b. Mining

The tin mining activities carried out by the Company are divided into two types: inland and offshore mining activities. PT Tambang Timah's inland mining activities throughout 2010 contributed 46 percent to the Company's total production of tin ore, while the remainder of 54 percent was obtained from offshore mining activities.

The inland mining operations are further divided into the following types: Hydraulic Mine (*Tambang Semprot* - TS) and Pontoon Suction Mine (*Tambang Ponton Isap Darat* - TPID). The Hydraulic Mines are in turn classified again into Large Mine (*Tambang Besar* - TB), Mechanical Mine (*Tambang Mekanik* - TM), and Small-scale Mine (*Tambang Skala Kecil* - TSK).

To manage its inland mining operations in the IUPs, PT Timah collaborates with private contractors that act as the Company's business partners based on a mutual work contract. The Company provides the mining plan based on a reserve map obtained from the drilling phase in order to obtain information

regarding the tin content of the reserve. Tin mining activities produce a variety of tin ore with a certain tin content.

The Company compels all its private contractors to adhere to the guidelines and procedures of environmental maintenance and occupational safety in performing all their activities. The tin ore resulting from the production by these business partners are then bought by the Company on a price that has been agreed upon earlier in the Cooperation Agreement.

c. Processing

The result from the mining or extraction processes is then brought to the subsequent phase, i.e. processing. The tin ore extracted from inland and offshore mines are processed in the washing facility to obtain at least 30% Sn content.

When the washing is done, tin ore are transported by barges to the Tin Ore Processing Plant (Pusat PengolahanBijih Timah—PPBT) for further processing to reduce the content of associated minerals in the tin ore, so that the Sn content of the tin ore can reach 70-74%. At such levels, the tin ore are now ready for further processing, namely smelting.

d. Smelting

During the smelting phase, the suitably high-grade tin ore are then smelted at a temperature of 232oC in the smelters into refined tin. To obtain high-quality tin metal, the result of the smelting phase is then further refined using the crystallizer and electrolytic refining technology. The product is refined tin with Sn content of more than 99%.

The ultimate product that results from the smelting and refining phases is tin ingot which weighs about 16 to 26 kilograms. This final product can be

shaped upon the request of the customer, and then packaged and is ready to be marketed under certain trademarks registered on the LME.

4.2 GRI Reporting Statement of PT. Timah (Persero) Tbk

Sustainability Report of PT. Timah (Persero) Tbk contained the Assurance Statement (20110505) by NCSR (National Center for Sustainability Reporting) and AA1000 (Licensed Assurance Provider). They make the statement about GRI Reporting, is as follow:

We have reviewed that GRI indicators referenced in the GRI index pages are reported either partially or fully and found that the report meets GRI G3.0 A+ application level.

Company performance indicator just reported either partially or fully applied the GRI Guidance. So, authors interest to evaluate the disclosure level of the company, for what reason the company just partially in applied the GRI Guidance for environmental indicators dislosure. Author also evaluate what's the other aspect should be considered and reported eventhough the disclosure level was stated "fully applied". Those are presented as recommendation in research result.

4.3 Company Perspective On Environmental Stewardship

The growth of PT. Timah (Persero) Tbk's business is accompanied with an extensive and integrated effort to manage and improve the quality of the environmental commitment to sustaining nature's capacity in a responsible manner.

It is of utmost importance to PT Timah to identify and manage the full range of risks that may bring impact on the environment where the Company operates, as well as to become a part of business that respect and protect the conditions of the environment.

We are therefore ready to allocate the necessary resources to mitigate the risks that may affect the environment in line with our development towards a world-class mining company.

We have a strong business rationale to run all our business activities upon the foundation of the sustainability principle. We thus feel compelled to do better than merely obeying the various standards of environmental conservation which certainly affect our performance as a business entity. Hence we integrate the aspects of management and improvement of the quality of the environment into our strategic objective, not only to ensure our business continuity, but also to improve the effectiveness of our risk management measures and to open new and lucrative business opportunities.

Environmental capacity is a finite resource that when prudently and responsibly managed will be able to fulfill the needs of generations after generations for almost indefinitely. PT Timah believes that everything that it obtains from nature—energy, water, soil, and other resources—must be utilized in the most optimal way possible. There is also a real economic benefit for us, instead of economic cost, to prioritize efficiency and optimization of such exploitation of natural resources.

Climate change, a clear consequence of global warming caused by the persistent proliferation of greenhouse gases in the atmosphere, has brought obvious and significant impacts on all living beings, not just humans, and undermine their ability to support their existence. In addition, the prices of many energy sources, especially the non-renewable ones such as petroleum and coal, tend to rise year by year as a logical consequence of its limited nature in the long run.

Both phenomena have propelled us to not only strive to utilize the present energy sources as productively as possible, but also to encourage innovation in order to open

new opportunities to reduce our need for and dependency on those energy sources we are currently exploiting.

We feel confident that by conserving the environment, the future of our posterity will be, in a sense, more guaranteed to be prosperous. That is a common value which we want to create and share through our activities in managing and improving the quality of the environment: that the future of the world is in the hands of us all, we who are now entrusted to manage it.

Therefore, in carrying out our business activities from year to year, we always prepare the Environmental Management Plans (*Rencana Pengelolaan Lingkungan*—RKL) and Environmental Supervision Plans (*Rencana Pemantauan Lingkungan*—RPL), which are made manifest in the best practices in mining so as to reduce the environmental impacts. Our commitment to the preservation of the environment is constantly evaluated and assessed by ourselves and also by independent parties, based on the ISO 14001 Environmental Management Systems which we obtained in 1997.

Furthermore, since 1992 we have propagated the practice of preparing the Environmental Impacts Analysis (*Analisa Mengenai Dampak Lingkungan*—AMDAL) documentation, a prerequisite that must be met by all businesses in order to achieve developmental sustainability. Moreover, as a State-Owned Enterprise, we continue to adhere to all the laws and regulations of the Government related to the environment, and we aim to be a model for other companies in Indonesia in terms of environmental stewardship.

There are at least five principal aspects related to the environment that we manage at all times in order to ensure our business continuity, namely:

a. Utilization of energy, water, and other natural resources,

b. Biodiversity and land functions,

c. Greenhouse gas emissions, tailings, and other waste materials,

d. Environmental impacts of the various business supporting activities, and

e. Post-mining land reclamation and recovery.

As a reference and guideline for our environmental conservation programs and post-mining land reclamation, a document known as a Statement of Sincerity has been signed by the Company, represented by its President Director, and witnessed by the Governor of the Bangka Belitung Province and the Minister of Forestry of the Republic of Indonesia.

Three strategic measures that we have implemented as a vital part of the Statement of Sincerety are:

a. Improve the knowledge and technical skills of the employees in protecting the quality of the environment,

b. Placing ethics and regulations regarding the awareness of environmental stewardship as a core material in the Company's good corporate governance guidelines, and

c. Requiring our business partners in mining to adhere to good mining practices and to prioritize occupational safety in all their conducts.

Our commitment and our concern on the environment resulted in our shares (TINS) being listed on the SRIKehati index throughout 2010. The SRI-Kehati index was launched by the Indonesia Stock Exchange and the Kehati Foundation in September 2009 to serve as a recommendation for investors that wish to invest their funds in companies that have significant awareness about the environmental stewardship and biodiversity conservation, social relationships, as well as good corporate governance.

4.4 The Disclosure of Environmental Performance Indicator

As the input to be evaluate in this research the following data is gathered from Sustainability Report PT. Timah (Persero) Tbk year 2010. The data is the full statement which presented in the company report. In order to evaluate whether the report accordance with GRI guidelines, following company report have presented the GRI indicators in bold type and in brakets at the the end of every paragraph or section title that pertains to specific criteria in the GRI Guidelines.

1. Utilization And Sustainability Of Natural Resources

   a. Material Utilization and Stewardship

      As a mining company, PT Timah conducts production processes whose primary raw materials consist of those extracted from the earth's crust. All those materials are found in abundance, however, they are not renewable. Hence, each of the materials we extract from the earth'scrust is utilized in the most optimal way possible so as to ensure the sustainability of the environmental capacity to provide for our business activities in the long run.

      The following table lists the materials we use in the various processes involved in the production of tin metal throughout 2010 at our two smelting plants, one located in Mentok and the other one in Kundur. Each of the materials involved in these production processes are is accompanied by its quantity stated in a standard unit of measurement.

b. Tin Smelting Material Usage (EN1)

Table 3: Tin Smelting Material used 2009 and 2010

Material Type	2010			2009			Description
	Smelting Plant			Smelting Plant			
	Mentok	Kundur	Total	Mentok	Kundur	Total	
Tin Ore	44,451	10,394	54,845	49,767	7,256	57,023	Raw input material
Slag (firts-stage)	36,398	5,613	42,011	50,369	951	51,320	Recycled input material
Dust	2,754	491	3,245	3,186	329	3,515	Recycled input material
Dross	9,634	2,982	12,616	12,702	1,813	14,515	Recycled input material
Hardhead	11.356	926	12.282	7.656	146	7.802	Recycled input material
Tin Metal	1,813	118	1,931	752	364	1,116	Recycled input material
Anthracite	14.735	2,614	17,349	17,122	1,548	18,670	Associated process material
Flux	2,965	-	2,965	4,156	360	4,516	Associated process material
Total Input Materials	**106,406**	**20,524**	**126,930**	**124,432**	**10,858**	**135,290**	
Total Material Used	**124,106**	**23,138**	**147,244**	**145,710**	**12,766**	**158,476**	

All figures are stated in thousands of kilograms (metric tons)

As shown on the above table, the materials which we recycle during the tin metal production processes in our smelting plants are slag, dust, dross, hardheads, and tin metal. The total weight of all recycled materials which we used in 2010 was 72,085,000, accounting for 49% of the total raw materials involved in the production processes. Percentage-wise, this amount is relatively stable compared to the previous year's figure, which was also 49%. **(EN2)**

The 7.1% decrease in the total amount of materials we use in our plants' production processes is in line with the fact that in 2010 we produced about 10% less refined tin than what we produced in 2009.

Considering the fact that the tin mining industry involves relatively lengthy production processes—starting from exploration, extraction, smelting, to the marketing of refined tin—we have implemented a number of concrete measures to improve our processes' efficiency and ensure our business continuity

at every link of the production chain, from material procurement down to waste management. In order to do that, we have formulated policies and programs for material stewardship that adhere to the principles of industrial efficiency and ecology.

The concrete measures which company have taken include:

1) Enhancing the production method by mixing the raw materials in the smelting process,
2) Mixing reducing agents with high HGI (Hardgrove Grindability) index and high fixed carbon content for the smelting of tin ore and first-stage slag,
3) Optimizing the smelting processes by the addition of dross into the raw material so that metal enrichment may successfully occur,
4) Refining Pb-Sn from the crystallizing process using the electrolytic refining method, and
5) Utilizing the multi gravity separator and jig tailing to minimize the concentration of Sn in the tailings.

c. Energy Utilization

Most of the energy which we utilize in our business operations is derived from fossil fuels, which are essentially non-renewable sources. This presents a couple of inherent problems, i.e. the declining amount of fossil fuel reserves on earth and the rising concentration of greenhouse gases in the atmosphere due to industrial combustion that accelerates the processes of climate change.

The primary source of energy which we utilize directly to drive the reduction processes in our smelting plants is anthracite coal. Meanwhile, the primary energy source for our dredges and machinery in our inland mines as well

as in our smelting plants, transport vehicles and power plants is high-speed diesel. We also use fuel oil in certain processes such as heating, raffination and regenerative cleaning. **(EN3)**

Table 4: Energy Utilization **(EN3)**

Primary Energy Source	*Unit*	*Quantity In 2010*	*Amount of Energy (GJ)*	*Quantity in 2009*	*Amount of Energy (GJ)*
Anthracite (coal)*	metric ton	20,000	570,000	14,001	399,092
High-speed diesel (HSD)**	liter	58,694,625	2,136,484	53,340,407	1,941,591
Fuel oil***	liter	14,775,447	561,467	18,273,481	694,342
TOTAL			**3,267,951**		**3,034,962**

*1 metric ton of anthracite (coal) is equivalent to 28.5 gigajoules.
**1 liter of high-speed diesel is equivalent to 0.0364 gigajoules.
***1 liter of fuel oil is equivalent to 0.038 gigajoules.

Throughout 2010, we consumed 3,267,951 gigajoules (GJ) of energy, derived from 73,470 kiloliters of fossil fuel in the form of fuel oil and high-speed diesel, and from 20,000 tons of anthracite coal.

Meanwhile, in 2010, our power plants in the Provinces of Bangka Belitung and Riau Archipelago produced about 15,991,182 kilowatt-hours (kWh) of electricity, or approximately 57,568 GJ. We managed to reduce our electricity consumption as much as 8.9% from a total of 17,537,100 kWh in 2009.

About 15,907,217 kWh or 99.5% of the total electricity we produced was consumed to support our own operations, and the rest was distributed to be used by other parties. Our power plants remain functional as a supplier of electricity for a number of public facilities in the islands of Bangka, Belitung and Kundur, as the electricity supply from the Government in these three regions is severely inadequate to cope with the demand.

While most of our demand for electricity is supplied by the diesel-powered power plants, we also, indirectly, consume electricity from outside parties to power some of our operational activities in the Head Office as well as in other locations. **(EN4)**

d. Energy Saving and Development of Renewable Energy Sources

It is our priority to be able to harness energy in a more efficient and economical way without hampering our productivity. Energy saving will not only reduce production costs; it will also bring positive impacts on environmental conservation.

Therefore, we have implemented a number of proactive and innovative endeavors in our production facilities, such as designing and constructing dredges that employ a cutter suction system that is more energy-efficient compared to the technology used in bucket line dredges.

We have also designed large mines to be opened in the years to come which will facilitate the mining operational efficiency improvement programs, so as to bring good results to our performance, not only environmentally, but also economically. **(EN5)**

Meanwhile, we attempt to develop new techniques to harness renewable energy for our production processes in the plants. We have obtained three kinds of renewable fuel sources that are ready to be used as alternative fuels to the high-speed diesel, i.e. olein and stearin (from palm oil), and castor oil. These three alternative fuel sources may also be utilized to power the machinery used in dredges and other ships. Prior to the practical transition to these alternative fuel sources, the Company aims to conduct a preliminary technical analysis and

business review first, as numerous production facilities belonging to the Company will be greatly affected by this overarching transition. **(EN6)**

We have also implemented several initiatives to reduce indirect energy consumption through the promulgation of policies and an energy-conscious culture in all our operational areas and also in the mindset of our employees. These policies encourage us to turn off electronic appliances that we are not currently using and all electronic appliances after operating hours, except during rare cases of extreme urgency.

The need for employee duty travels, especially those via airplanes which is the most energy- and fuel-intensive means of transport, has also been managed more selectively and prudently by the Company. We have a stringent selection process for duty travels based on the priority of each trip, and encourage the use of teleconferences via the internet or telephone whenever the circumstances allow.

The Company has further facilitated each Head of Business Unit with a cellular telecommunication device, in order to enhance their decision-making ability to arrive at sound decisions effectively without being obstructed by either their location or issues of time. **(EN7)**

c. Water Usage and Water Recycling

Water is used in enormous amounts throughout the tin extraction processes, both those performed inland and offshore, to spray the layers of the earth that are rich in tin ore and to isolate tin ore from other materials present in the soil. We also require water for the process of smelting tin, especially during the washing of tin ore and as coolant to prevent the overheating of our machines and power generators.

Those facts compel us to be prudent and efficient in our water management. We must focus on our water usage at all times if we are to improve our performance. Our production processes use surface water withdrawn from reservoirs and the damming of rivers and streams in the vicinity of the Company's mines. In addition, ground water and pre-treated seawater are also used in those processes.

In 2010, a complete record of water consumption was done by the Metallurgy Unit, while the records from other units were not yet comprehensive. The Metallurgy Unit in 2010 consumed a total of 502,784 cubic meters (kiloliters) of water, all of which was obtained from the reservoirs and dams. This figure was 11% less than the Metallurgy Unit's total water usage in 2009, i.e. 566,123 cubic meters. **(EN8)**

The diversity of the bodies of water which we use as our water sources means that we withdraw no more than 5% of each body of water's total volume for our operational activities. We also ensure that none of our water sources are sensitive nor have the possibility of disrupting the stability of the environment or certain populations of species. Therefore, our water withdrawal activities do not significantly affect these bodies of water in terms of the lowering of the water table and decreasing the volume of water available to local communities in the long run. Our water sources have not experienced any disturbance related to the inability of the ecosystem to function normally. Throughout the reporting period, we received zero complaints from the public or the Government with respect to our water withdrawal. **(EN9)**

Although water is a renewable resource, excessive and irresponsible use of water tends to alter, and often worsen, its quality, availability and capability to

support lives. That is the rationale behind our implementation of several efficiency measures in terms of water usage and water management, which in short aim to reuse part or all, whenever possible, the water we have used previously for our production processes and mining activities.

One of the concrete measures which we have undertaken is to implement a closed circulation system to supply most of the water we need. We obtained a license from the Local Government to confine water into established reservoirs and then direct the water into mining locations and production units via large pipes and canals. The water in these pipes and canals is used, filtered through a process whereby mud and other materials are removed, and then directed back into the closed circulation system to be subsequently used, again and again. A certain amount of water from our dams is only added when the volume of water in the closed circulation system has decreased below the limit we have previously established. **(EN10)**

2. Biodiversity Conservation

a. Habitat Conservation

It is our endeavor to make our inland and offshore mining operations bring as little negative impact as possible to the preservation of biodiversity. All inland mining activities conducted by PT Timah in Bangka and Belitung Islands take place in specific areas that have been designated as a mining permit (IUP) areas by the Government.

We fully acknowledge that about 20.61% or 20.718 ha of forested area in our inland IUPs are designated as protected forest. Thus, in order to preserve the forest along with the habitats for various species, our inland mining operations are

conducted in locations that are not overlapping with areas designated as protected forest nor with areas outside the protected forest but with high biodiversity value. **(EN11)**

Table 5: Inland IUP Areas **(EN11)**

Type	Unit	Bangka	Belitung	Total in 2010	Percentage of Total	Total in 2009
Productive Forest	Hectare	71,671	8,155	79,826	79,39%	111,679
Protected Forest	Hectare	16,783	3,935	20,718	20,61%	27,812
TOTAL	hectare	88,454	12,090	100,544	100%	139,491

The mining industry is an industry that exploits the economic value of natural resources contained within the earth. Therefore, mining activities will certainly have various impacts on land conversion, changes in vegetation structure, ecological processes, as well as the natural topography where these activities take place. We are cognizant of the fact that the mining operations we conduct have the potential to generate all these impacts on the forest habitat and the biodiversity contained therein. In addition, we also take into consideration and thus minimize the social impacts of our operations, by ensuring that all our mining activities do not force the local community out of their settlements only because we are using their land as mining sites. **(EN12, EN14)**

Fully realizing that certain negative impacts are inevitably generated by our mining operations, we attempt our best to reduce these said impacts on the environment in and around our mines. Prior to opening a new mining area, we conduct a number of surveys to identify and record the existing biodiversity in the area, in order to determine whether there are endangered or protected species living there. If there are, then the stance that we take is to relocate these species

into protected forest areas or to other areas outside of the mining operational areas. **(EN13, EN14)**

We constantly strive to cut down the negative impacts of our mining activities on the biotas, especially marine biota, by monitoring the condition of biodiversity in parts of the ocean where our ships conduct mining activities. Our dredges are prohibited from operating within a certain radius from the coastline that has been known to be a coral reef-covered zone. In addition, a type of our dredges, the KKs, are able to conduct mining operations in deeper waters, and prior to performing all their activities, they must first ascertain that no coral reef will be disturbed by their operations. The quality of sea water in the operational areas of our ships is also monitored and maintained at all times so as not to endanger the marine biota. **(EN14)**

b. Post-Mining Land Reclamation

As an essential part of our responsibility in conducting the entire process of tin metal production, in this case related to the mining of tin ore on land, we have taken a number of initiatives to conduct post-mining land management in our IUP areas through land reclamation measures.

The primary objective of our land reclamation measures is to restore the habitats and biodiversity of the land to their original state as broadly as possible, to the time before the mining activities were conducted. These reclamation measures will allow the post-mining land to regain its original functionality, based on spatial planning and zoning, and thus enable the land to support the natural biodiversity and livelihoods of local communities.

These post-mining land reclamation activities come in four distinct stages. The first stage is land preparation, which includes pushing the tailings back into the mining pits, heaping the tailings with overburden material, leveling the land, improving the soil quality using agricultural lime and fertilizer, loosening the soil for the planting of covering vegetation, fixing the stakes and establishing the planting holes on the soil, and controlling for soil erosion around the pits.

The second stage, in essence, is the planting activities. The main covering vegetation is planted in the planting holes that have been filled with topsoil, manure or compost, urea and organic fertilizers, according to their respective dosages.

The third stage involves the treatment of the vegetation, carried out by fertilizing the plants three times a year, replacing the dead plants, and controlling the pests.

The fourth stage consists of observing and growing the plants, for which the activities range from the monitoring of reclamation activities, such as measuring plant height, stem diameter, plant stem and canopy cover, levels of regeneration, proportion of successful growth and soil acidity, to running chemical and physical tests to measure soil fertility and the water quality in the pits.

The implementation of post-mining land reclamationmeasures directly involves the local communities andbusiness partners for the treatment of vegetation. Therefore, the utility function of these activities can beimmediately felt by the communities. As the types of vegetation grown on the reclaimed land are productiveplants, then the yield of these crops may be directly consumed or economically exploited by the public.

The area of reclaimed land in 2010 was 1,379.55 ha in Bangka and 241.6 ha in Belitung, with a total area of 1,621.15 ha. Meanwhile, in 2010 we successfully leveled 548 hectares of post-mining land as part of our reclamation (restoration) measures. As of the year 2010, the post-mining land restoration activities which has been conducted since 1992 has leveled about 5.305 hectares of land and revegetated 7.184 hectares. With the completion of the restoration processes in these post-mining areas, the integrity of the forest as a natural habitat can now be generated again, and in turn, the stability of the surrounding environment and the renewable resources contained therein will be well-preserved. **(EN13)**

The total cost that we spent to hire our business partners in conducting the leveling and revegetation activities throughout the year 2010 was Rp 8,168,691,383. **(EN30)**

c. Protection of Endangered Species

The mining activities conducted by the Company may alter the functionality of the soil where the operations takeplace. Therefore, these activities perturb the ecologicalstate of the habitats that support the survival of amultiplicity of species. In our IUP areas, there have been discovered a number of internationally-protected species which have been included in the Red List published by the International Union for the Conservation of Nature(IUCN), a leading international institution dedicated to the preservation of species and natural resources.

The IUCN's Red List is the most comprehensive listing of species with respect to the conservation status of the world's flora and fauna. This list

categorizes hundreds of thousands of species and subspecies found around the world based on the criteria that determine the extinction risk of each species.

As of the end of the reporting period, we identified a number of species present in our inland and offshore IUP areas. These species are listed on the following table.

Table 6: Species of Concern **(EN15)**

Species	**IUCN's Conservation Status**
Coral reef	Endangared
Oysters/Scallops	Endangared
Sea worms	Endangared
Sea molluscs	Endangared
White shrimp (Panaeus merguinensis)	Threatened
Tiger shrimp (Paneus monodon)	Threatened
Mud/Mangrove crab (Scylla serrata)	Vulnerable

3. Management And Control Of Effluents, Emmisions And Waste

a. Greenhouse Gas Emmisions

As an industrial company that contributes to the increasing amount and concentration of greenhouse gases in the atmopshere, PT Timah strives to maintain the emissions of such greenhouse gases from its production processes at the minimum amounts possible, so that their overall impacts on the environment and the atmosphere can be minimized.

A number of our operations directly emit greenhouse gases, in particular carbon dioxide or CO2 which results from electricity generation from diesel power plants, combustion processes, and operations of machinery at our mines. Throughout 2010, we were in the process of implementing a CO2 emission measurement program, and so at the end of the reporting period we were still

unable to report its exact value. We are determined to fully implement a carbon footprint measurement program in 2011. **(EN16)**

In addition, on a far smaller scale, our other operational activities, such as duty travels, use of transportation means on land and at sea, and office work at our offices, also contributed to the Company's total greenhouse gas emissions. We also have yet to measure our total greenhouse gas emissions from these minor business activities. **(EN17)**

Nevertheless, in order to streamline our energy consumption successfully, as well as to reduce the Company's contribution of greenhouse gases to the atmosphere, we continue to identify and promulgate alternative approaches that we deem more eco-friendly to conducting our activities, which include reducing the amount of employee travels and intensifying the use of teleconferences. Although we are certain that such measures are pivotal in reducing our greenhouse gas emissions, we have yet to measure the exact amount of reduction.

We have mitigated our greenhouse gas emissions by reducing the amount of carbon atoms churned out to the atmosphere via the chimneys of our power plants, Tin Ore Washing Center, smelting units, workshops, and inland mine power generators, by implementing the selective non-catalytic reduction technology. Its implementation, based on our calculations, reduced the amount of emitted carbon from these units for as much as 75 to 98 percent. We staunchly support the Government's programs to reduce greenhouse gas emissions as part of the climate change and global warming mitigation strategies. One of PT Timah's specific measures in aiding the Government tackle the issues of climate change and global warming is tree planting in conjunction with the Provincial Government of Bangka Belitung's program called Green Babel. The details of our

activities related to environmental conservation are presented in the following two sections of this chapter. **(EN18)**

b. Ozone-Depleting Gas Emissions

The usage of certain chemical compounds in various industries, including tin mining, may generate, as byproducts, halogenated gases (those that containhalogen atoms, such as chlorine and bromine). The characteristics of the tin mining industry, however, means that the amount of halogenated gases we release to the atmosphere remains relatively small. These halogenated gases, especially chlorofluorocarbons, or CFCs, are capable of reducing the ozone layer in the atmosphere very quickly. This is a risk that must be addressed as the ozone layer protects living beings on earth from molecular damages caused by solar radiation.

As of the end of this reporting period, we had not calculated the exact amount nor identified the main sources of emissions of these ozone-depleting gases within the Company's operational areas. **(EN19)**

c. NOx and SOx Emissions (EN20)

Tin ore smelting activities in the Metallurgy Units in Mentok and Kundur involve processes that generate gases that are classified as nitrogen oxides (NOx) and sulfur oxides (SOx).

Nitrogen oxides and sulfur oxides are considered air pollutants as they are detrimental to living beings by triggering the occurence of acid rain, degrading air quality, worsening forest degradation, and causing various health problems. Therefore, the concentrations of these gases in the atmosphere must controlled

and, whenever possible, reduced. The Indonesian Government has determined the maximum limits for those two categories of gases, and it is our top priority in terms of emission control to minimize the amount of NOx and SOx gases which we release to the atmosphere.

To control our SOx emissions, for many years we have implemented the flue gas desulphurization technology complete with the baghouse filters which, upon testing, have been proven to reduce the total emission of SO2 from our chimneys by 80%.

Meanwhile, to control our NOx emissions, we have implemented the selective non-catalytic reduction technology that has been proven to reduce nitrogen oxide (NO2) emissions in our exhaust by 75 to 98 percent.

We control our NOx and SOx emissions in order to certify that the exhaust resulting from our production processes does not bring serious harm to the health of humans and other living beings, and also does not reduce air quality.

There are also certain financial benefits for the Company, because the implementation of both technologies mentioned above have resulted in cleaner chimneys that help improve the performance of our machinery and streamline our fuel consumption greatly.

d. Effluent Management

Our main focus related to the management of solid wastes and effluents is to ensure that the wastes we release into our surroundings through our mining activities and production processes brought the least negative impact on the environment and also on the local communities in the areas where we operate. In

addition, our approach to responsible waste management is guided by the 3R principles of reduce, reuse and recycle.

Throughout 2010, we took necessary measures to minimize the amount of spills and wastewater we release to water bodies, while minimizing the negative impacts of the wastes. These measures include the measuring and monitoring of wastewater quality using multifarious parameters to ensure that the our wastewater and other effluents have met certain quality standards set by the regulations of the Government. Each month we conducted tests to measure the quality of our wastewater. Excerpts from the tests are shown in the following table. **(EN21)**

Table 7: Average Test Result of Waste Water Parameters In Reservoir PM Outlet Mentok Metallurgy Unit

PARAMETER	UNIT	QUALITY STANDARD	Mar-10	Jun-10	Sep-10	Dec-10
Total Suspended Solids						
(TSS)	mg/l	200	37	23	7	6
Turbidity	NTU		36	43	11	3
CHEMICAL						
pH	mg/l	6-9	8.0	7.2	6.9	7.4
Cooper(Cu)	mg/l	2	<0.02	<0.02	<0.02	<0.02
Zinc (Zn)	mg/l	5	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/l	0.1	<0.01	<0.01	<0.01	<0.01
Arsenic (As)	mg/l	0.1	<0.005	<0.005	<0.005	<0.005
Sulfide (H2S)	mg/l	0.05	<0.002	<0.002	<0.002	<0.002
Dissolved Iron (Fe)	mg/l	5	<0.06	<0.06	<0.06	<0.06
Manganese (Mn)	mg/l	2	0.12	<0.02	<0.02	<0.02
Tin (Sn)	mg/l	2	<0.4	<0.4	<0.4	<0.4
Total Chromium (Cr)	mg/l	0.5	<0.02	<0.02	<0.02	<0.02

The waste water produced at the Tin Ore Washing Plants at the Mentok Metallurgy Unit is processed and treated at our wastewater treatment facility and subsequently discharged into the sea directly. This wastewater treatment facility applies the solid material deposition technology through a closed circulation system. Therefore, all the dissolved solids will eventually settle, and afterwards the remaining wastewater will be purified and separated from certain dissolved elements considered hazardous.

Prior to being discharged into the sea, all the wastewater must be ensured to have met the quality standards specified by the Government. We run daily tests to examine our wastewater quality, and once a month the wastewater is tested by independent laboratories which have obtained accreditation from the National Accreditation Commission.

Meanwhile, at the Pemali open pit mine, some of the wastewater is discharged into rivers in the vicinity of the mine, only after undergoing a series of strict supervision which ensures that the wastewater no longer contains elements that are detrimental to health and disruptive to riverine ecosystems. **(EN21)**

The closed circulation system for water is also implemented at our inland mines, so that the wastewater which we have produced can be entirely recovered to be reutilized further. No residual waste water from mining activities is discharged directly into rivers, and throughout 2010 we did not receive any report nor identify damages to ecosystems in water bodies or habitats in the vicinity of our mines. **(EN25)**

d. Management of Solid Wastes and Hazardous and Woxic Wastes

A number of our operational activities generated certain solid wastes which can be grouped into two categories.

The first category is wastes that are relatively harmless and have no negative impacts on human health, such as paper wastes, garbage, and other domestic wastes. The management for this type of waste is done according to the principles of reuse and recycle, which we either carry out internally (in the Company) or delegate to other parties. **(EN22)**

The second category is wastes that are considered hazardous and toxic, including those with radioactive elements. The management for this type of waste is done with extreme caution regarding their storage, demolition, and also utilization. Some of the solid wastes which we treat exclusively due to the hazardous metals contained in them are ilmenite, monazite, xenotime and zircon. Meanwhile, thorium and uranium are also treated exclusively because they are radioactive.

The hazardous and toxic wastes are provisionally stored at the Temporary Storage Site at Baturusa, to be eventually incinerated. Some of the wastes are also transferred to third parties, all of whom have obtained license from the Government to manage the wastes, to be further treated.

Some of the actions concerning the treatment of hazardous and toxic wastes at our temporary storage site are: **(EN24)**

1) placement of informative signboard at the temporary storage site,
2) placement of symbols and warnings about potential hazards from radioactive exposure on the signboard,

3) implementation of a full inventory of wastes categorized as hazardous metals and radioactive elements once every three months; and
4) routine inspections involving the Nuclear Energy Supervisory Agency *(Badan Pengawasan Tenaga Nuklir).*

In addition to ensuring that the amount of wastes we produce is mantained at a minimum, all the solid wastes from our operations are also managed carefully according to their specific properties, so that no significant damages are caused to the environment and the local communities where we operate.

The amounts of some hazardous and toxic wastes, both in solid and liquid forms, which we generated in 2010 are persented in the table below.

Table 8 : Hazardous and Toxic Waste Products **(EN24)**

Hazardous and Toxic Waste	**Unit**	**Volume in 2010**	**Volume in 2009**
Water for washing anode (liquid waste)	liter	961.600	959.900
Slime ex. UPL II	liter	37.718	11.749
Acid waste ex. Labs	liter	19.801	20.099

As all the treatments and management of wastes from our operations are either done internally or delegated to third parties that have obtained the license from the Government to treat wastes, there were no hazardous and toxic wastes or other solid wastes exported or imported by the Company in 2010. **(EN24)**

We closely monitor the usage of chemicals, lubricants and fuels in our mining activities and production processes, which encompass the activities of these materials' transport, relocation and utilization, so that these activities are carried out with great care, and thus avoiding spills or other unwanted incidents that may wreck nature's biodiversity, disturb the functionality of the soil and the

atmosphere, and create damage to human health. The measures we took in 2010 were proven to be effective since throughout that year the Company never experienced any incident related to the spillage of chemicals, lubricants, or oil, nor received any complaint regarding such matters. **(EN23)**

4. Environmental Initiatives And Practices

a. Tin Products Impact Mitigation tiatives (**EN26**)

Tin, the main product of the Company, is used in many sectors in the industry, and as a producer of tin metal, we have conducted the evaluation necessary to measure the actual performance of the design and management of our products, which include methods of disposal and recycling, in order to ensure the sustainability of the industry.

As with many other metals, tin is essentially a material that is relatively easy to recycle, and successive utilizations of tin through various well-managed recycling programs will increase its productivity, while also reducing the energy required to make new product instead as well as the emissions and waste generated.

Currently, a majority of the tin contained in electronic products and packagings as well as the residue from the production processes are recycled and collected to be reused. The recycling levels for the world's tin products, according to ITRI estimates, are about 8% for the pure metal, 20% for bronze and brass alloys, and up to 40% for solder material.

In addition, our tin products have obtained certifications ensuring their quality, i.e. LME BS EN 610:1996 from the London Metal Exchange and ASTM B 339-1995 from ASTM International. The exceptional quality of our products

indicates that our products are to be utilized by our customers in a proper and effective manner, and therefore we expect that the adverse impacts on the environment to be greatly reduced.

Throughout 2010, PT Timah did not recall any of the products it had sold to the public to be reprocessed, reused or recycled. **(EN27)**

b. Compliance with Environmental Regulation

In conducting all our operational activities, our compliance with the applicable laws, regulations and international standards related to the environmental aspect is a priority that we champion at all times.

Therefore, in 2010, we never received any charge or conducted any violation of the rules and regulations of the environment, and hence we never received any sanctions or were required to pay any fine. **(EN28)**

c. Environmental Impacts of The Transport Of Our Products and Employees **(EN29)**

The materials resulting from our mining activities, both conducted inland and offshore, are transported to the smelters using a number of transportation modes. Once they are smelted, the finished products are then transported to our warehouses or the ports for shipment. This transport of raw materials and finished products certainly creates impacts on the environment, among others in the form of exhaust emissions from the various transportation modes used, such as trucks and barges.

By maintaining the efficiency and controlling the exhaust emissions from a number of transportation modes that we own and operate ourselves to comply

with Government regulations, we strive to minimize air pollution from the transportation of our products.

In addition, we have also conducted a periodic monitoring of air quality in certain locations along our regular transportation routes, and discovered that throughout 2010 the concentrations of dust particles and exhaust gases from vehicles were within specified quality standards.

Other efforts which we have done include reducing the frequency of employees' official travels and transportation to and from ships, as well as hiring transportation and shipping companies with a credible reputation for delivering our products to our customers around the world.

5. Environmental Restoration

In 2010, PT Timah disbursed a total fund of Rp 8.17 billion for environmental restoration efforts within the Company's operational areas. Meanwhile,the CSR funding used for environmental conservation programs in year 2010 amounted to Rp 590 million. **(EN30)**

Throufhout 2010, we carried out several reforestation programs as part of our CSR strategy implementation to help alleviate the burden of the environment.

On 9 February 2010 we handed over five units of threewheeled sanitation vehicles and 2,000 plant stems to the District Government of West Bangka.

On 22 July 2010, in celebration of the 50th anniversary of the Prosecution Service Corps, we handed over 5,000 tree seedlings for reforestation at the villagers of Penyamun, Pemali, Sungailiat.

On 28 November 2010, commemorating the Indonesian Tree Planting Day, we collaborated with the Forestry Service of Bangka Belitung Archipelago to plant

10,000 trees in a 16-ha plot of land in Hutan Kota Tua Tunu. The types of trees planted include mahogany, eaglewood, albizia and fruit trees.

6. Noncurrent Liabilities

The Company's noncurrent liabilities as of 31 December 2010 reached Rp 409 billion, up Rp 86 billion or 27% compared to the figure in 2009. This rise was mainly owing to the increase in the provision for environmental rehabilitation of Rp 86 billion, or 191%.

The Company's total provision for environmental rehabilitation as of the end of 2010 reached Rp 200 billion. About 34% of the amount constituted a part that was planned to be used within a one-year period, while theremaining 66% was a part planned to be used long term.The amount of provision for rehabilitation costs expended throughout 2010 was Rp 7.9 billion. **(EN30)**

4.5 Evaluation of Disclosure Level of Environmental Indicator in PT.Timah (Persero) Tbk

GRI Guidelines 2010 has standardize the Environmental Indicator. Then in order to evaluate the disclosure level of Environmental Indicator in PT. Timah (Persero) Tbk the matrix below is present the Environmental Indicator GRI 3.1 followed by each company's environmental indicator disclosure, authors evaluation and recommendation.

1. Indicator

The matrix will show the list of environmental indicator code accordance with GRI 3.1. (The indicator description was shown in Page. 69-71)

2. Disclosures

Authors will summarizes each environmental indicators disclosures of PT. Timah (Persero) Tbk which has presented as original company report above (Page. 140-162).

3. Evaluation

Authors presented the evaluation of disclosures level is accordance with GRI 3.1, wether company's environmental indicators is applied, partially applied, not appllied or even the guidelines is not applicable to this company. The GRI-Content Index Checklist (compatibility mode) and compilation of environmental indicator help authors to find the data requires by GRI Guidelines to disclose, wether qualitative or quantitative data. (Shown in Appendix 2)

4. Recommendation

Finally, in this matrix authors also state the recommendation addressed to this company. The recommendation build up objectively, based on the research evaluation result, such as the lack of company in implementing GRI standard. So, the recommendation made accordance with the GRI standard. Beside that, it also strengthen by author knowledge based on the other theory stated in theoritical framework of this research.

Table 9: Reseach Output (The Matrix: Evaluation of Disclosure Level of Environmental Indicator)

NO	INDI CATOR	DESCRIPTION	GRI STANDARD	DISCLOSURES	PAGE	EVALUATION OF DISCLOSURE LEVEL	RECOMMENDATION
1.	EN1	Materials used by weight or volume.	1. The total of materials used 2. The total weight or volume of non-renewable materials used. 3. The total weight or volume of direct materials used.	1. Total Material Used 147,244,000 kg 2. Total weight of non-renewable material used 147,244,000 kg 3. Total input materials 126,930,000 kg	P. 127	Fully applied	The total weight or volume of non-renewable materials used should be disclosed with explicit statement. Input material should change with direct materials used should be disclose.
2.	EN2	Percentage of materials used that are recycled input materials.	1. The weight or volume of recycled input materials.	1. The total weight of all recycled materials which we used in 2010 was 72,085,000	P. 127	Fully applied	Assesment percentage of following year is better to be disclose, to show the concern of company toward the efficiency of material used in the future.
3.	EN3	Direct energy consumption by primary energy source.	1. Total energy consumption in joules or multiples. 2. Total direct energy consumption in joules or multiples by renewable primary source. 3. Total direct energy consumption in joules or multiples by non-renewable primary source.	1. Total energy consumption 3,267,951 GJ 2. Most of the energy which we utilize in our business operations is derived from fossil fuels, which are essentially non-renewable sources. 3. Total energy consumption 3,267,951 GJ	P.128	Fully applied	Total direct energy consumption in GJ by renewable and non-renewable primary source should be disclose clarity.
4	EN4	Indirect energy consumption by primary source.	1. Total amount of indirect energy used by indirect renewable and non-renewable source in terms of intermediate energy. 2. The corresponding primary energy consumed in its production	1. About 15,907,217 kWh or 99.5% of the total electricity we produced was consumed to support our own operations.	P.129	Partially applied	The corresponding primary energy consumed in its production need to be disclose in quantitative data
5.	EN5	Energy saved due to conservation and efficiency improvements.	1. Total energy saved by efforts to reduce energy use and increase energy efficiency 2. Total amount of energy saved in joules or multiples taking into consideration energy saved due to process redesign, conversion and retrofitting of equipment, and changes in personnel behavior.	1. We managed to reduce our electricity consumption as much as 8.9% from a total of 17,537,100 kWh in 2009. 2. We have implemented a number of proactive and innovative endeavors in our production facilities, such as designing and constructing dredges that employ a cutter suction system. We have also designed large mines to be opened in the years to come which will facilitate the mining operational efficiency improvement programs	P.130	Partially applied	Total amount of energy saved should also disclosed in joules or multiples taking into consideration energy saved due to process redesign, conversion and retrofitting of equipment, and changes in personnel behavior.

6.	EN6	Initiatives to provide energy-efficient or renewable energy based products and services. and reductions in energy requirements as a result of these initiatives.	1. Existing initiatives to reduce the energy requirements of major products/product groups or services 2. Quantified reductions in the energy requirements of products and services achieved during the reporting period.	1. We have obtained three kinds of renewable fuel sources that are ready to be used as alternative fuels to the high-speed diesel, i.e. olein and stearin (from palm oil), and castor oil which utilized to power the machinery used in dredges and other ships.	P.130	Partially applied	Company sould be disclosed the quantified reductions in the energy requirements of products and services achieved during the reporting period.
7.	EN7	Initiatives to reduce indirect energy consumption and reductions achieved.	1. Initiatives to reduce indirect energy use. 2. The extent to which indirect energy use has been reduced during the reporting period for use of energy-intensive materials, subcontracted production, business-related travel and employee commuting. 3. Underlying assumptions and methodologies used to calculate other indirect energy use and indicate the source of information.	1. Implemented several initiatives to reduce indirect energy consumption through the promulgation of policies and an energy-conscious culture in all our operational areas and also in the mindset of our employees. 3. The Company has further facilitated each Head of Business Unit with a cellular telecommunication device, in order to enhance their decision-making ability to arrive at sound decisions effectively without being obstructed by either their location or issues of time.	P.131	Partially applied	Need to discose the quantified extent to which indirect energy use has been reduced during the reporting period for use of energy-intensive materials, subcontracted production, business-related travel and employee commuting.
8.	EN8	Total water withdrawal by source	Report the total volume of water withdrawn in cubic meters per year (m3/year) by the following sources: 1. Surface water, including water from wetlands, rivers, lakes, and oceans; 2. Ground water: 3. Rainwater collected directly and stored by the reporting organization; 4. Waste water from another organization; 5. Municipal water supplies or other water utilities.	1. Our production processes use surface water withdrawn from reservoirs and the damming of rivers and streams in the vicinity of the Company's mines. In addition, ground water and pre-treated seawater are also used in those processes 2. The Metallurgy Unit in 2010 consumed a total of 502,784 cubic meters (kiloliters) of water, all of which was obtained from the reservoirs and dams. This figure was 11% less than the Metallurgy Unit's total water usage in 2009. i.e. 566,123 cubic meters.	P.132	Partially applied	Total volume of water in m3 withdrawn from other water source that was either withdrawn directly by the reporting organization or through intermediaries such as water utilities by ground water and pre-treated seawater need to be disclosed.
9.	EN9	Water sources significantly affected by withdrawal of water.	Report the total number of significantly affected water sources by type according to the criteria above, indicating the following: 1. Size of water source in cubic meters. 2. Whether or not the source is designated as a protected area (nationally and/or internationally) 3. Biodiversity value (e.g., species diversity and endemism, number of protected species). 4. Value/importance of water source to local communities.	Withdraw no more than 5% of each body of water's total volume.We also ensure that none of our water sources are sensitive nor have the possibility of disrupting the stability of the environment or certain populations of species. Therefore, our water withdrawal activities do not significantly affect these bodies of water in terms of the lowering of the water table and decreasing the volume of water available to local communities in the long run. Throughout the reporting period, we received zero complaints from the public or the Government with respect to our water withdrawal.	P.132	Not applied	Eventhough the water sources is not significantly affected by withdrawal of water in short term but company need to analyze the impact of water withdrawal in long-term. In order to enhance the accuracy, clarity and reliability of the disclosure, the regulation about the percentage of significant and non significant the need to be standardize.

10	EN10	Percentage and total volume of water recycled and reused.	1. The total volume of water recycled/reused in m3 by the organization per year. 2. The total volume of water recycled/reused by the organization as a percentage of the total water withdrawal reported under EN8.	The water in these pipes and canals is used, filtered through a process whereby mud and other materials are removed, and then directed back into the closed circulation system to be subsequently used, again and again. A certain amount of water from our dams is only added when the volume of water in the closed circulation system has decreased below the limit we have previously established.	P.133	Partially applied	The total volume of water recycled/reused in m3 by the organization per year should be disclosed. Disclose the quantified total volume of water recycled/reused by the organization as a percentage of the total water withdrawal reported under EN8.
11	N11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.	Report the following information for each operational site identified above: 1. Geographic location; 2. Subsurface and/or underground land that may be owned, leased, or managed by the organization; 3. Position in relation to protected area (in the area, adjacent to, or containing portions of the protected area) and high biodiversity value area outside protected area; 4. Type of operation (office, manufacturing/ production, or extractive) 5. Size of operational site in km2; 6. Biodiversity value	All inland mining activities conducted by PT Timah in Bangka and Belitung Islands and about 20.61% or 20.718 ha of forested area in our inland IUPs are designated as protected forest. Thus, in order to preserve the forest along with the habitats for various species, our inland mining operations are conducted in locations that are not overlapping with areas designated as protected forest nor with areas outside the protected forest but with high biodiversity value.	P.133	Partially applied	Add the disclosure of operational sites owned, leased, managed, located in, adjacent to, or that contain portected areas and areas of high biodiversity value outside protected areas, by: size of operational site in km2.
12	EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.	The nature of significant direct and indirect impacts on biodiversity with reference to one or more of the following: 1. construction or use of manufacturing plants, mines, and transport infrastructure 2. pollution; 3. introduction of substances that do not naturally occure in the habitat from point and non-point sources; 4. reduction of species; 5. habitat conversion; 6. changes in ecological processes outside the natural range of variation Significant direct and indirect positive and negative impacts with reference to the following: 1. species affected 2. extent of areas impacted 3. duration of impacts 4. reversibility or irreversiblity of the impacts.	Mining activities will certainly have various impacts on land conversion, changes in vegetation structure, ecological processes, as well as the natural topography where these activities take place. We are cognizant of the fact that the mining operations we conduct have the potential to generate all these impacts on the forest habitat and the biodiversity contained therein.	P.134	Partially apllied	Company need to clearly disclosed significant direct and indirect positive and negative impacts of species affected, extent of area impacted, duration of impact and reversibility or irreversibility of the impact.
13	EN13	Habitats protected or restored.	1. The size and location of all habitat protected areas and/or restored areas	1. The area of reclaimed land in 2010 was 1,379.55 ha in Bangka and 241.6 ha in	P.137	Partially applied	Should report whether the success of the restoration measure was/is approved by

			2. If restored: whether the success of the restoration measure was/is approved by independent external professionals. 3. Whether partnerships exist with third parties to protect or restore habitat distinct from where the organization has overseen and implemented restoration or protection measures.	Belitung, with a total area of 1,621.15 ha. Meanwhile, in 2010 we successfully leveled 548 hectares of post-mining land as part of our reclamation (restoration) measures. As of the year 2010, the post-mining land restoration activities which has been conducted since 1992 has leveled about 5.305 hectares of land and revegetated 7.184 hectares.			independent external professionals. And also report whether partnerships exist with third parties to protect or restore habitat distinct from where the organization has overseen and implemented restoration or protection measures.
14	EN14	Strategies, current actions, and future plans for managing impacts on biodiversity.	1. If national regulations have influenced the specific strategies, actions or plans reported under this Indicator. 2. The organization's strategy for achieving its policy on biodiversity management. 3. Including integration of biodiversity considerations in analytical tools such as environmental site impact assessments. 4. Including engagement with relevant stakeholders 5. Including methodology for establishing risk exposure to biodiversity. 6. Including setting specific targets and objectives. 7. Including monitoring processes. 8. Including public reporting. 9. The actions underway to manage biodiversity risks identified in EN11 and EN12 or plans to undertake such activities in the future.	Company take into consideration and thus minimize the social impacts of our operations, by ensuring that all our mining activities do not force the local community out of their settlements only because we are using their land as mining sites. Prior to opening a new mining area, we conduct a number of surveys to identify and record the existing biodiversity in the area, in order to determine whether there are endangered or protected species living there. If there are, then the stance that we take is to relocate these species into protected forest areas or to other areas outside of the mining operational areas. We constantly strive to cut down the negative impacts of our mining activities on the biotas, especially marine biota, by monitoring the condition of biodiversity in parts of the ocean where our ships conduct mining activities. Our dredges are prohibited from operating within a certain radius from the coastline that has been known to be a coral reef-covered zone. In addition, a type of our dredges, the KKs, are able to conduct mining operations in deeper waters, and prior to performing all their activities, they must first ascertain that no coral reef will be disturbed by their operations. The quality of sea water in the operational areas of our ships is also monitored and maintained at all times so as not to endanger the marine biota.	P.134	Fully apllied	Report will be more better if add clearly disclosure of company engagement with relevant stakeholders.
15	EN15	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.	The number of species in habitats identified as affected by the reporting organization, indicating one of the following levels of extinction risk: critically endangered; endangered; vulnerable; near threathened and least concern.	We identified a number of species present in our inland and offshore IUP areas with each IUCN's Conservation Status: Coral reef (Endangared), Oysters/Scallops (Endangared), Sea worms (Endangared), Sea molluses (Endangared), White shrimp (Threatened), Threatened (Threatened), Mud/Mangrove crab (Vulnerable).	P.138	Fully applied	The quantitative data of species number better to be disclose.

16	EN16	Total direct and indirect greenhouse gas emissions by weight.	1. Indicate the standard used, and indicate the methodology associated with the data with reference to: direct measurement; calculation based on site specific data; calculation based on default data; estimations. 2. Total greenhouse gas emissions as the sum of direct and indirect emissions in tonnes of CO2 equivalent.	A number of our operations directly emit greenhouse gases, in particular carbon dioxide or CO2 which results from electricity generation from diesel power plants, combustion processes, and operations of machinery at our mines. Throughout 2010, we were in the process of implementing a CO2 emission measurement program, and so at the end of the reporting period we were still unable to report its exact value. We are determined to fully implement a carbon footprint measurement program in 2011	P.138	Partially apllied	Should disclosed quantitative total greenhouse gas emissions as the sum of direct and indirect emissions in tonnes of CO2 equivalent.
17	EN17	Other relevant indirect greenhouse gas emissions by weight.	The sum of indirect GHG emissions identified in tonnes of CO2 equivalent.	On a far smaller scale, our other operational activities, such as duty travels, use of transportation means on land and at sea, and office work at our offices, also contributed to the Company's total greenhouse gas emissions. We also have yet to measure our total greenhouse gas emissions from these minor business activities.	P.139	Partially applied	Company should measure immediately the sum of indirect GHG emissions identified in tonnes of CO2 equivalent, because at the end of the year that amount should be disclose quantitavely in the sustainability report.
18	EN18	Initiatives to reduce greenhouse gas emissions and reductions achieved.	1. Initiatives to reduce greenhouse gas emissions, including the areas where the initiatives were implemented. 2. The extent of greenhouse gas emissions reductions achieved during the reporting period as a direct result of the initiative(s) in tonnes of CO2 equivalent	Company identify and promulgate alternative approaches that we deem more eco-friendly to conducting our activities, which include reducing the amount of employee travels and intensifying the use of teleconferences. We have mitigated our greenhouse gas emissions by reducing the amount of carbon atoms chumed out to the atmosphere via the chimneys of our power plants, Tin Ore Washing Center, smelting units, workshops, and inland mine power generators, by implementing the selective non-catalytic reduction technology. Its implementation, based on our calculations, reduced the amount of emitted carbon from these units for as much as 75 to 98 percent.	P.139	Partially applied	Company should measure immediately the quantitatively the extent greenhouse gas emissions reductions achieved during the reporting period as a direct result of the initiative(s) in tonnes of CO2 equivalent, so at the end of the year company can report it.
19	EN19	Emissions of ozone-depleting substances by weight.	The emissions of specific ozone-depleting substances in tonnes and tonnes of CFC-11 equivalent.	The amount of halogenated gases we release to the atmosphere remains relatively small. These halogenated gases, especially chlorofluorocarbons, or CFCs, are capable of reducing the ozone layer in the atmosphere very quickly. This is a risk that must be addressed as the ozone layer protects living beings on earth from molecular damages caused by solar radiation. As of the end of this reporting period, we had not calculated the exact amount nor identified the main sources of emissions of these ozone-	P.139	Partially applied	The report should contain the emissions of specific ozone-depleting substances in tonnes and tonnes of CFC-11 equivalent because greater than 0 that can deplete the stratospheric ozone layer is substance of an ozone depletion potential (ODP)

				depleting gases within the Company's operational areas.			
20	EN20	NOx, SOx, and other significant air emissions by type and weight.	The weight of significant air emissions (in kilograms or multiples such as tonnes) for each of the following categories: 1. NOx. 2. Sox 3. persistent organic pollutants (POP) 4. volatile organic compounds (VOC). 5. hazardous air pollutants (HAP). 6. stack and fugitive emissions. 7. particulate matter (PM). 8. other standard categories of air emissions identified in regulations.	To control our SOx emissions, for many years we have implemented the flue gas desulphurization technology complete with the baghouse filters which, upon testing, have been proven to reduce the total emission of SO2 from our chimneys by 80%. to control our NOx emissions, we have implemented the selective non-catalytic reduction technology that has been proven to reduce nitrogen oxide (NO2) emissions in our exhaust by 75 to 98 percent.	P.141	Partially applied	Should disclosed the total weight of significant air emission include: Nox, Sox, POP, VOC, HAP, PM, stack and fugitive emissions.
21	EN21	Total water discharge by quality and destination.	The total volume of planned and unplanned water discharges in cubic meters per year by each of the following categories: 1. Destination 2. Treatment method 3. Whether it was reused by another organization 4. If effluents or process water are discharged: the water quality in terms of total volumes of effluents using standard effluent parameters.	We measuring and monitoring of wastewater quality using multifarious parameters to ensure that the our wastewater and other effluents have met certain quality standards set by the regulations of the Government. Each month we conducted tests to measure the quality of our wastewater (table 7) At the Pemali open pit mine, some of the wastewater is discharged into rivers in the vicinity of the mine, only after undergoing a series of strict supervision which ensures that the wastewater no longer contains elements that are detrimental to health and disruptive to riverine ecosystems.	P142	Partially applied	Should disclose the total volume of planned and unplanned water discharges in cubic meters per year by destination, treatment method and wether it was reused by another organizaton.
22	EN22	Total weight of waste by type and disposal method.	The total amount of waste (hazardous & non-hazardous) in tonnes by type for each of the following methods: 1. Composting; 2. reuse; 3. Recycling; 4. Recovery; 5. composting; 6. incineration (or use as fuel); 7. Landfill; 8. deep well injection 9. on-site storage; 10. other (to be specified by the reporting organization) How the method of disposal has been determined.	Wastes that are relatively harmless and have no negative impacts on human health, such as paper wastes, garbage, and other domestic wastes. The management for this type of waste is done according to the principles of reuse and recycle. Wastes that are considered hazardous and toxic, including those with radioactive elements. The management for this type of waste is done with extreme caution regarding their storage, demolition, and also utilization.	P144	Partially applied	Should disclose quantitatively the total amount of waste (hazardous & non-hazardous) in tonnes by type for reuse, recycle, and on-site storage. How the method of disposal has been determined.
23	EN23	Total number and volume of significant spills.	1. The total number and total volume of recorded significant spills. 2. Impact of the significant spills.	We closely monitor the usage of chemicals, lubricants and fuels in our mining activities and production processes, which encompass the activities of these materials' transport, relocation and utilization, so that these activities are carried out with great care, and thus avoiding spills or	P.145	Not applied	The spills which not have a significant volume also need to be concerned. Because might be affected environment in a long term. Need to developed the regulation about the exact amount of significant and non

				other unwanted incidents that may wreck nature's biodiversity, disturb the functionality of the soil and the atmosphere, and create damage to human health. The measures we took in 2010 were proven to be effective since throughout that year the Company never experienced any incident related to the spillage of chemicals, lubricants, or oil, nor received any complaint regarding such matters.			significant spills.
24	EN24	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.	1. Total weight of hazardous waste transported in kilograms or tonnes. 2. Total weight of imported hazardous waste in kilograms or tonnes. 3. Total weight of exported hazardous waste in kilograms or tonnes. 4. Total weight of treated hazardous waste in kilograms or tonnes.	As all the treatments and management of wastes from our operations are either done internally or delegated to third parties that have obtained the license from the Government to treat wastes, there were no hazardous and toxic wastes or other solid wastes exported or imported by the Company in 2010.	P145	Not applied	Company should be represent the brief disclosure of transported, imported, exported, or treated waste deemed hazardous for previous years, in order enhance the timeline of the disclosure report.
25	EN25	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.	Report water bodies significantly affected by water discharges based on criteria above, adding information on: 1. size of water body in cubic meters. 2. whether the source is designated as a protected area. 3. biodiversity value.	The closed circulation system for water is also implemented at our inland mines, so that the wastewater which we have produced can be entirely recovered to be reutilized further. No residual wastewater from mining activities is discharged directly into rivers, and throughout 2010 we did not receive any report nor identify damages to ecosystems in water bodies or habitats in the vicinity of our mines.	P.143	Not applied	Eventhough there is no residual wastewater from mining activities which discharged directly into rivers but company should be aware with the risk which can be appear in the long-term.
26	EN26	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.	1. Report Iinitiatives to mitigate the most significant environmental impacts of products/service groups in relation to; materials use, water use, emissions, effluents, noise, waste. 2. Report quantitatively the extent to which environmental impacts of products and services have been mitigated during the reporting period.	Tin is essentially a material that is relatively easy to recycle, and successive utilizations of tin through various well-managed recycling programs will increase its productivity, while also reducing the energy required to make new product instead as well as the emissions and waste generated.	P.146	Not applied	Eventhough there is no significant environmental impact but Company should develop the initiatives to reduce environmental impacts in maximum ways in order to meet the efficiency of reducing environmental impact with the companys profit regarding the successes of making good image from stakeholder.
27	EN27	Percentage of products sold and their packaging	1. The percentage of reclaimed products and their packaging materials for each	Currently, a majority of the tin contained in electronic products and packagings as well as the	P.146	Fully applied	Next year company should increase material and resource efficiency by

		materials that are reclaimed by category.	category of products. 2. How the data for this Indicator has been collected.	residue from the production processes are recycled and collected to be reused. The recycling levels for the world's tin products, according to ITRI estimates, are about 8% for the pure metal, 20% for bronze and brass alloys, and up to 40% for solder material.Throughout 2010, PT Timah did not recall any of the products it had sold to the public to be reprocessed, reused or recycled.			achieve progress of effective recycling and reuse systems.
28	EN28	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.	1. Total monetary value of significant fines. 2. Number of non-monetary sanctions. 3. Cases brought through dispute resolution mechanisms.	In conducting all our operational activities, our compliance with the applicable laws, regulations and international standards related to the environmental aspect is a priority that we champion at all times. Therefore, in 2010, we never received any charge or conducted any violation of the rules and regulations of the environment, and hence we never received any sanctions or were required to pay any fine.	P.127	Not applied	To avoid the financial risks that occur directly through fines and indirectly through impact on reputation, company must ensure the daily operation is on the line (compliance with environmental laws and regulation). The corporate culture also need to be develop because by enhancing the environmental culture, company can avoid the compiance and indirectly can get more profit as a result of good image from stakeholders.
29.	EN29	Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.	1. The significant environmental impacts of transportation used for logistical purposes. 2. The significant environmental impacts of transportation of the members of the organization's workforce. 3. The criteria and methodology used to determine which environmental impacts are significant. 4. How the environmental impacts of transporting products, members of the organization's workforce, and other goods and materials are mitigated.	By maintaining the efficiency and controlling the exhaust emissions from a number of transportation modes that we own and operate ourselves to comply with Government regulations, we strive to minimize air pollution from the transportation of our products. In addition, we have also conducted a periodic monitoring of air quality in certain locations along our regular transportation routes, and discovered that throughout 2010 the concentrations of dust particles and exhaust gases from vehicles were within specified quality standards. Other efforts which we have done include reducing the frequency of employees' official travels and transportation to and from ships, as well as hiring transportation and shipping companies with a credible reputation for delivering our products to our customers around the world.	P.147	Fully applied	The quantitative amount is better to be disclose in order to meet the reliability of report. Eventhogh its impossible to make zero impact of transporting process to environment, but compay should find the effective and efficient methodology to maximize the mitigation of transporting impact. Company can achieve the significant reduction of transporting impact by changes several technology in transporting product. For example using the biofuel trasportation which low cost for the near location, such as production plants and warehouses. It can achieve the cost culture which mean achieve the efficiency cost with minimizing the environmental effect
30.	EN30	Total environmental protection expenditures and investments by type.	Total environmental protection expenditures broken down by: 1. waste disposal 2. emissions treatment	1. Reclamation cost: The total cost that we spent to hire our business partners in conducting the leveling and revegetation activities throughout the year 2010 was Rp 8,168,691,383.	P.137	Partially applied	Report should presented the disclosure of total environmental protection expenditures broken down by waste disposal, emissions treatment and also

			3. remeditation costs. 4. prevention costs 5. environmental management cost	2. Restoration cost: In 2010, PT Timah disbursed a total fund of Rp 8.17 billion for environmental restoration efforts within the Company's operational areas. Meanwhile,the CSR funding used for environmental conservation programs in year 2010 amounted to Rp 590 million. 3. Rehabilotation cost: The Company's total provision for environmental rehabilitation as of the end of 2010 reached Rp 200 billion. About 34% of the amount constituted a part that wasplanned to be used within a one-year period, while theremaining 66% was a part planned to be used long term.The amount of provision for rehabilitation costs expended throughout 2010 was Rp 7.9 billion.			cost of prevention and management.

The matrix above presented the evaluation of disclosure level of 30 environmental indicator. Eventually, as the final result of this research, following table show the percentage of each disclosure level.

Table 10: The percentage of disclosure level of environmental indicator in sustainability report PT. Timah (Persero) Tbk.

No.	Disclosure Level	Total	Percentage
1.	Fully applied	7	23.33%
2.	Partially applied	17	56.67%
3.	Not applied	6	20%
	TOTAL	30	100%

There are many information that author can analyze from each of the indicator disclosure. Generally, the company has fulfil the GRI standard,we can see it from the fulfilment all of the disclosure of environmental indicator. But if we see from the number of percentage above shows the materiality of environmental indicator and company's commitment to fulfil the GRI standard. The biggest amount of disclosure level percentage is partially applied which is 56.67%, and it is the significant amount which shows that the company have low commitment in fulfil the GRI standard. Generally, most of the the reason which make the company just can disclose the content indicator partially is because company has not fulfil the quantitative data which substantially important to be disclosed. The quantitative amount is better to be disclose in order to meet the reliability of report. Most of the factors is because the indicator in real condition is relatively not significant.

Based on this research, the company has 23.33% fully applied. It means the company need to take more commitment in fulfil the GRI standard. Thus, eventhough has disclose seven indicator but the company should consider and add several additional information related to enhance the quality of the report, and development of several aspect related to cost culture and environmental culture.

Company has not applied the environmental indicator as much as 20%, but still disclose the indicator briefly inthe report. It means the company has fulfill the GRI standard which required the company to disclose the core indicator eventhough it is not material. Based on the disclosure author found that in most indicator stated that thereis significant bad impact of company operation toward environmental, include, hazardous and waste water. Eventhogh company has already make the efficiency in most indicator but company still can achieve the significant reduction of enviromental impact by changes several technology and process. After that, company should develop the cost culture which mean achieving the efficiency cost by using the effective amount of resources so company can minimize the environmental effect. So, eventually as the result, the company indirectly can get more profit because of good image to stakeholders.

CHAPTER V

CONCLUSION

5.1 Conclusion

Organizations can improve their sustainability performance by measuring, monitoring and reporting on it, helping them have a positive impact on society, the economy, and a sustainable future. The key drivers for the quality of sustainability reports are the guidelines of the Global Reporting Initiative (GRI). This guidelines is used as the International standard as a gudance to small and big company to report their sustainability performance.

As one of the biggest Mining Company's of the world, PT.Timah (Persero) Tbk have big reponsibility to the environment sustainability. Means this company is required to make the sustainability report accordance with the GRI standard. So, in order to find out whether this company completely followed GRI standard, especially the environmental performance, this research is conducted. After evaluate each of the disclosure level of company's environmental performance, author found that from 30 environmental indicator there just 23.33% is fully applied, 56.67% is partially applied and 20% not applied the GRI standard. It means, this company need extra word and management commitment to fulfil the GRI standard.

5.2 Recommendation

After finished this research author recommend Timah (Persero) Tbk, as followed:

1. To ensure the responsibility toward the environmental impact of their wide operation, this company should fully followed the National and International regulation, laws and standard.

2. The company should disclosed the core indicator in explicit statement which accordance with GRI standard, both quantitative and qualitative data.

3. Assesment percentage of following year is better to be disclose, to show the concern of company toward the efficiency of material used in the future.

4. The report should be accomplished after all of the requirement is fulfill. So there is no sentences in the report state that "the measurement to this year had not competed".

5. For several disclosure of the environmental indicator, the company should enhance the validity of the succesful implementation by add the other party's statement, such as government and independent auditor statement.

6. Company should be more concern with their operation toward environment impact in long term.

7. Company can achieve the significant reduction of enviromental impact by changes several technology and process.

8. Company should develop the cost culture which mean achieve the efficiency cost with minimizing the environmental effect.

For doing further research, things suggested are:

1. To reseacrh two or more company as a research object to compare the application of GRI standard.
2. The data to be research is 5 years period in order to know the trend of company in terms of consistency toward sustainable environment.
3. To require more complete data in order to give more accurate result and to complete other variable measurements.

5.3 Research Implication

1. The regulation need to be develop in order to achieve the reliability of the indicator disclosure. In several disclosure of indicator there is no exact amount of data which classified as significant and not significant matter.

2. The corporate culture of company need to be enhance. Company should develop high environmental culture, so every people in company can managed to improve our business efficiency and efficacy, and therefore recorded significant growths in both financial and non-financial performance indicators. Thus, companay also need to meet the efficiency of environmental culture and cost culture, it means the company can achieve cost efficiency by using efficient number of resources without damaging the environment. So, on the other hand, company can manage low cost but still fulfil the sustainability of environmental standard.

5.4 Research Limitation

This study has limitations that may cause interference bias on research results. This research just based on the report from the company without research directly the real condition of company. So, there are possibility that the data which collected is not reliable.